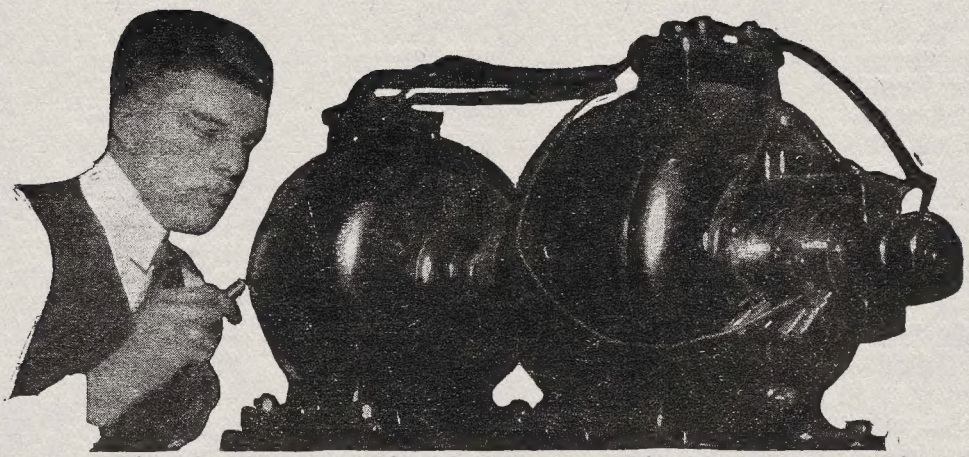
January
WRNY
25 Cents
AMAZING STORIES
HUGO GERNSBACK
EDITOR
Scientifiction

INSIDE FRONT COVER

MISSING



I Learned ELECTRICITY
This Amazingly Easy Way

Why spend your life waiting for $5 raises in a dull, hopeless job? Now . . . and forever . . . say good-bye to 25 and 35 dollars a week. **Let me show you how to qualify for jobs leading to salaries of $50, $60 and up, a week, in Electricity**—NOT by correspondence, but by an amazing way to train, that makes you a practical electrician in 90 days! Getting into electricity is far easier than you can imagine!

Learn By-Doing in 90 Days

LACK of experience, age or advanced education bars no one. I don't care if you don't know an armature from an air brake—

if ars

oney of the have no than you why I have my astonish-

I Prepare You for Jobs Like These

Here are a few of hundreds of positions open to Coyne-trained men. Our free employment bureau gives you lifetime employment service.

Armature Expert, $50 a wk. & up
Substation Operator, $65 a wk.
Auto Electrician, $50 a wk. & up
Inventor . . . . . Unlimited
Maintenance Engineer, ... $60 a Week and up
Service Station Owner, ... $60 a Week and up
Radio Expert, $60 a week & up

Not a Correspondence School

Learn by doing . . . all real actual work . . . no dull books, no baffling charts, but building real batteries . . . winding real armatures, operating real motors, dynamos and generators, wiring houses, etc., teaching you far more than the average ordinary electrician ever knows. That's how we fit you immediately to hold Big-Pay electrical jobs after graduation.

Many BIG-PAY Jobs to Suit You

Don't worry about a job. Coyne training settles the job question for life. Big demand for Coyne trained men often exceeds supply. Our employment department gives you lifetime service. Two weeks after graduation, Clyde F. Hart got a position as electrician with the Great Western R. R. at over $100 a week.

FREE Employment Service

COYNE is your one great chance to get into electricity. Every obstacle is removed. This school is 29 years old—Coyne training is tested—proven beyond all doubt—endorsed by many large electrical concerns. You can find out everything absolutely free. Simply mail the coupon and let me send you the big, free Coyne book of 150 photographs . . . facts jobs . . . salaries . . . opportunities. Tells you how many earn expenses while training and how we assist our graduates in the field. This does not obligate you. Act now!

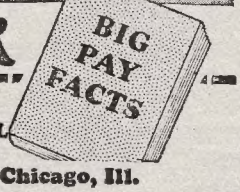
Now In Our New Home

This is our new, fireproof, modern home, wherein is installed thousands of dollar's worth of the newest and most modern Electrical Equipment of all kinds. We now have a larger amount of floor space devoted to the exclusive teaching of practical electricity. Every comfort and convenience has been arranged to make you happy and contented during your training.

...rn while you learn

Many of my students earn a good part or all their living expenses and should you need this assistance we will help you. ...en, in 12 brief weeks, in the great roar-shops of Coyne, I train you as you ...reamed you could be trained . . . ...of the greatest outlays of electrical ...s ever assembled . . . real dyna-...gines, power plants, autos, switch-..., transmitting stations . . . every-...from doorbells to farm power and ...nting . . . full-sized . . . full operation every day! Nowhere else in the world can you get such Big-Pay-Job training!

Get this FREE Book



$60 to $200 a Week
Jobs Not Unusual

We can point to many Coyne men making up to $600 a month. $60 a week is only the beginning of your opportunity. You can go into radio, battery or automotive electrical business for yourself—and make $3000 a year and up.

H. C. Lewis, Pres.
COYNE ELECTRICAL SCHOOL, Dept. 19-02
500 S. Paulina St., Chicago, Ill.

Dear Mr. Lewis:

Without obligation send me your big free Book and all details of Free Employment Service, Radio and Automotive Courses, and how many "earn while learning." I understand I will not be bothered by any salesman.

Name .....

Address .....

City ..... *State* .....

COYNE ELECTRICAL SCHOOL
H. C. LEWIS, Pres., Dept. 19-02
500 S. Paulina Street **Established 1899** **CHICAGO, ILLINOIS**

JULES VERNE'S TOMBSTONE AT AMIENS PORTRAYING HIS IMMORTALITY

AMAZING STORIES

January, 1929
Vol. 3, No. 10

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Publishers of SCIENCE & INVENTION, RADIO NEWS, RADIO LISTENERS' GUIDE, AMAZING STORIES QUARTERLY, YOUR BODY

Owners of Broadcast Station WRNY

In Our January Issue:

The War of the Planets
By Harl Vincent 872

The Sixth Glacier
A Serial in 2 parts (Part I)
By Marius 900

Cauphul, The City Under the Sea
By George Cookman Watson 918

Absolute Zero
By Harold Moorhouse Colter 937

The Roger Bacon Formula
By Irvin Lester and Fletcher Pratt 940

Our Cover

this month depicts a scene from "The Sixth Glacier," by Marius, in which the Woolworth and Municipal Buildings, giant prides of New York, are seen giving way to the fierce strength of the onrushing masses of ice, rapidly sweeping over the entire length and breadth of the city, leaving nothing but devastation and ruin in its wake.

In Our Next Issue:

THE CAPTURED CROSS-SECTION, by Miles J. Breuer, M.D. By mathematics, one, Simon Newcomb, an eminent scientist, proved the impossibility of flying machines. By mathematics, many a scientific theory has been proved and disproved equally absolutely. The Fourth Dimension is no exception. In this story, the scientist not only does a lot of interesting figuring, but he actually introduces an entirely new method to supplement his figures, which seems quite plausible, and in the story, at least, proves very effective. Dr. Breuer knows what he wants to say and knows how to say it. He keeps the reader in complete absorption and anxious suspense to the very end.

THE SIXTH GLACIER, by Marius. A serial in two parts (Part II). In the concluding chapters, the author continues his story in the same engrossing manner, to tell about the further devastations caused by the fast oncoming glaciers, while the earth still moves in the frigid volume of space. Why and how the world is finally rehabilitated is well told, in gripping detail.

PHAGOCYTES, by A. H. Johnson. Until comparatively recently, or more specifically, until William Harvey, the scientist, discovered it, we knew nothing about blood [illegible]. This story deals with just this subject in such a way that you get 99% good information in a most interesting manner. Perhaps there will be a way of telling us what is going on in that great thinking machine we call "The Human Body." We commend this unusual "story" heartily.

MERNOS, by Henry James. Several years ago were discovered in 1928. Professor [illegible] supposed to have found an extra Neptune, far behind the orbit of Neptune, and he gave its diameter, its mass and its orbit, though it has not yet been found in the telescope. "Mernos" is a charming interplanetary Extravaganza about a new—thus far undiscovered—planet, which will delight the reader.

And others.

HOW TO SUBSCRIBE TO "AMAZING STORIES." Send your name, address and remittance to Experimenter Publishing Co., 230 Fifth Ave., New York City. Checks and money orders should be made payable to Experimenter Publishing Co., Inc. Mention the name of the magazine you are ordering inasmuch as we also publish RADIO NEWS, SCIENCE & INVENTION, RADIO LISTENERS' GUIDE AND CALL BOOK, AMAZING STORIES QUARTERLY and YOUR BODY. Subscriptions may be made in combination with the other publications just mentioned at special reduced club rates. Send postal for club rate card. Subscriptions start with the current issue unless otherwise ordered.
ON EXPIRATION of your subscription we enclose a renewal blank in your last number to you, and notify you by mail. Then, unless we receive your order and remittance for a renewal, delivery of the magazine is stopped.
CHANGE OF ADDRESS. Notify us as far in advance as possible, giving your old address as well as the new one to which future magazines are to go. It takes several weeks to make an address change in our records.

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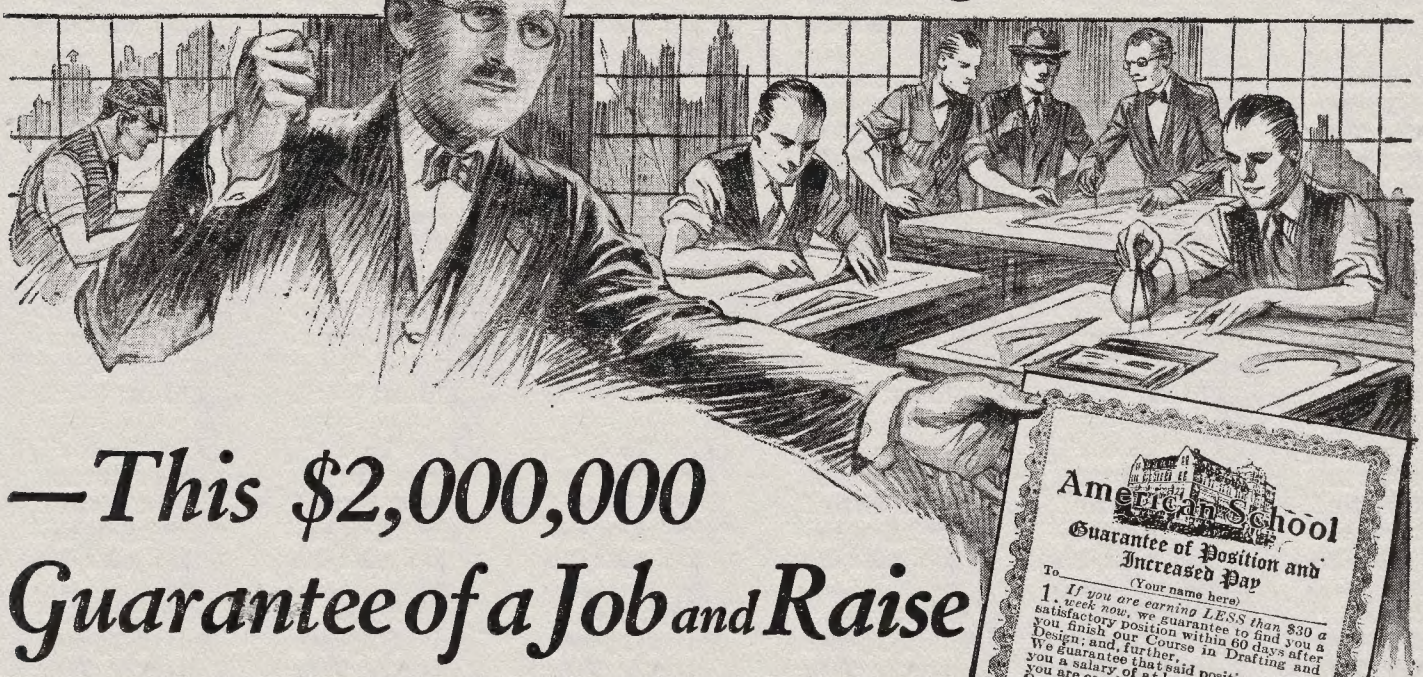
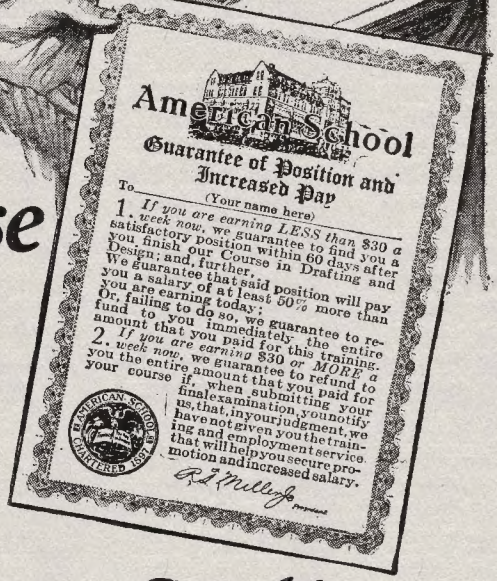
Have you the Courage to take it?



—This $2,000,000 Guarantee of a Job and Raise


American School
Guarantee of Position and Increased Pay
To
(Your name here)
1. If you are earning LESS than $30 a week now, we guarantee to find you a satisfactory position within 60 days after you finish our Course in Drafting and Design; and, further,
We guarantee that said position will pay you a salary of at least 50% more than you are earning today;
Or, failing to do so, we guarantee to refund to you immediately the entire amount that you paid for this training.
2. If you are earning $30 or MORE a week now, we guarantee to refund to you the entire amount that you paid for your course if, when submitting your final examination, you notify us, that, in your judgment, we have not given you the training and employment service that will help you secure promotion and increased salary.
R. L. Miller Jr.

OF course you'd like to earn $50 or $75 or $100 a week—you'd like to do more interesting work—you'd like to get into a line that offers a real future—but do you know how to go about *getting* these things?

If you have been thinking of "taking a course" but have held back because you were afraid you didn't have education enough to learn better-paid work—if you have hesitated to take the risk that it would actually land you in the better position and increase your salary—*then here's the best news you ever heard in your life!*

I want to tell you about DRAFTING, and show you that it offers you everything in pay and opportunity that you could hope for. I want to show you that a fine Drafting job is now easily within your reach. And I want to set before you an amazing plan which we have worked out with the co-operation of some of the biggest employers and engineers in America, to prepare you at home, in spare-time, get you the job and raise your pay—absolutely without risk of a penny on your part.

"Only one other man and I, of six taking California State Board examination for Architect, passed. Then I realized the thorough and practical training given by American School. In 18 months I have gone from tracer to Chief Draftsman, in charge of all architectural and engineering work in one of the oldest offices here."

R. L. WARREN,
Los Angeles, Calif.

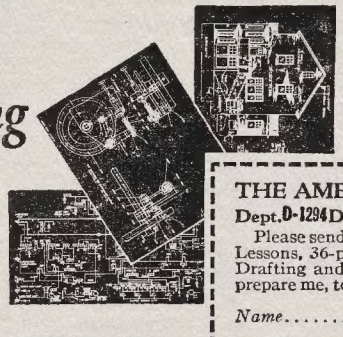
Come Into DRAFTING!

Thousands of men—not a bit smarter than you, with no more schooling or experience—have gone from poorly paid positions as clerks, mechanics, building trade workers and laborers into Drafting positions paying $50 to $100 a week, with our help. Now with a job and a raise waiting for you *as soon as you are ready for it*, all it takes is the COURAGE to go after it—now if you remain in the rut it's because you choose to, not because you have to.

"When I started American School training in the Spring of 1915 I was working 14 hours a night, seven nights a week for $1.83 a night. That Fall I got a job in the Engineering Dept. of a large firm near here. Today I work 5½ days a week and my salary is larger than I ever dreamed of when I began that course in Mechanical Drafting."

B. H. SEAVERNS,
South Bend, Ind.

3 Drafting Lessons *Actually* FREE *to show you how interesting and simple Drafting is*



Maybe you think Drafting is "over your head"—that it takes artistic talent or some ability you haven't got. In that case you have a pleasant surprise coming to you. For I'll be glad to send you the first three lessons from our home-training to show you that the drawing of plans is purely mechanical, easily learned and the most interesting kind of work you ever tackled. It takes little enough courage *to look into* this wonderful opportunity—just mail the coupon and see for yourself how you like Drafting and our guaranteed way to get into it.

The American School Dept. D-1294 Drexel Ave. and 58th St., Chicago, Ill.

Get this "No-Risk" Plan!

I wish I had the room here to tell you all about DRAFTING—how it has become the most important branch of every kind of manufacturing and building construction work—how fascinating the work is—the fine bunch of fellows you'll work with—the big salaries paid—the wonderful chances for advancement. How, while Drafting is white-collar office work, it is hooked up closely with big projects and big men, and offers the thrill that goes with making plans which govern every move of the men who do the work. All this inside dope takes a 36-page book to describe and I'll be glad to send you a copy free when you mail the coupon for my no-risk job and raise plan.

O. C. Miller

Director Extension Work.

THE AMERICAN SCHOOL
Dept. D-1294 Drexel Ave. and 58th St., Chicago, Ill.

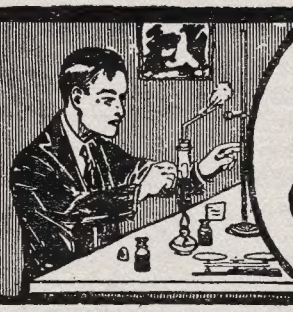
Please send without cost or obligation, 3 Drafting Lessons, 36-page book with the inside dope about Drafting and your no-risk plan and guarantee to prepare me, to place me and raise my pay, or no cost.

Name.....

St. No.....

City.....*State*.....

Age.....*Occupation*.....



Dr. T. O'Conor Sloane will teach you - CHEMISTRY Right in your own Home

Good Chemists Command High Salaries

T. O'CONOR SLOANE
A.B., A.M., LL.D., Ph.D.

Noted Instructor, Lecturer and Author. Formerly Treasurer American Chemical Society and a practical chemist with many well known achievements to his credit. Not only has Dr. Sloane taught chemistry in the classroom, but he was for many years engaged in commercial chemical work.

Industrial firms of all kinds pay tempting salaries to get the right men. Salaries of $10,000 to $12,000 a year are not unusual for chemists of exceptional abilities. Chemistry offers those who are ambitious and willing to apply themselves conscientiously the greatest opportunities of any vocation. Why be satisfied with small pay and hard, thankless work—learn the profession of Chemistry and your salary will depend only upon your own efforts and your own abilities.

The work of the chemist is extremely interesting. If you are fond of experimenting, if you like exciting and fascinating work, take up Chemistry. To the man who is dissatisfied with his present job, to the young man just deciding on his life work, Chemistry holds alluring charms and countless opportunities. If you want to earn more money, the way is open through our course in Chemistry.

NOW IS THE TIME TO STUDY CHEMISTRY

Never before has the world seen such splendid opportunities for chemists as exist today. The war has awakened the United States to the need of trained chemists and chemical engineers. Everywhere the demand has sprung up. In factories, mills, laboratories, electrical shops, industrial plants of all kinds, chemistry plays a vital part in the continuation and expansion of the business. In every branch of human endeavor the need for chemists has arisen. No profession offers such alluring opportunities, and the next ten years are going to show the greatest development in this science that this country has ever seen. Those who have the foresight and ambition to learn chemistry now will have the added advantages and greater opportunities afforded while the chemical field is growing and expanding.

What Well-Known Authorities Say About Our Course

From Hudson Maxim:

"Dr. Sloane has done a much-needed work in a much better way than anything of the kind has, heretofore, been done.

"Dr. Sloane has a remarkable faculty of presenting Science for self-instruction of the student in such a clear and understandable way as to be most readily grasped and assimilated.

"I, therefore, unreservedly recommend and place my highest indorsement on his work."

From Dr. W. W. de Kerlor:

"I can not recommend your course too highly and I congratulate both you and Dr. Sloane on same."

From John A. Tennant:

"This is something which has long been needed. Your long experience in the teaching of chemistry . . . assurance that the course will be practical as well as plain to the untrained students."

What the Students Say:

"Your course has been worth $50,000 to my concern."

"This is just like reading some fascinating fiction story."

"I have just been made assistant chemist of my concern."

"You may be pleased to learn that I have re-entered the laboratory of my former employers as their chief chemist. The work under my care involves several hundred thousand dollars a year."

"I am going to keep right at the study, for it has helped me greatly. It is really the knowledge I have gained from it that made it possible to hold the job I have at present."

"Let me state that I have obtained a new and better position; this is with the Heller and Merz Aniline Dye Co. in their main laboratory. Thanks to your course I am well prepared and able to hold same."

"I like the lessons so much that I honestly would not sell them for many times their price."

"I am taking this opportunity to express my satisfaction with your chemical lessons."

"I now have a fine position as chemist at the Du Pont Dye Works. It was thru your course alone that I have been so successful."

"I have written to different people about your course and they speak very highly of same."

"If I don't learn it isn't your fault for I find that your lessons contain a whole lot."

(Names and addresses on request.)

You Can Learn At Home

Ability to Understand Plain English the Only Requirement

Dr. Sloane will teach you Chemistry in a practical and intensely interesting way. Our home *study course* written by Dr. Sloane himself is practical, logical and remarkably simple. It is illustrated by so many experiments that are performed right from the start that anyone, no matter how little education he may have, can thoroughly understand every lesson. Dr. Sloane teaches you in your own home with the same individual and painstaking care with which he has already taught thousands in the classroom. He will, in addition, give you any individual help you may need in your studies. This personal training will be of inestimable value to you in your future career.

Experimental Equipment Given to Every Student

We give to every student, without additional charge, this chemical equipment, including fifty pieces of laboratory apparatus and supplies and thirty-nine different chemicals and reagents. The fitted heavy wooden box serves not only as a case for the outfit but also as a laboratory accessory for performing countless experiments. Full particulars about this special feature of our course are contained in our free book "Opportunities for Chemists."

DIPLOMA AWARDED TO EACH GRADUATE

Upon graduation each student is awarded our Diploma in Chemistry, certifying that he has successfully completed his studies. Your name on this certificate will be a source of pride to you all your life, as well as an aid to obtaining a position in Chemistry.

Easy Monthly Payments

You do not have to have even the small price of the course to start. You can pay for it in small monthly amounts or earn it as many others are doing. The cost is very low, and includes even the Chemistry outfit—there are no extras to buy with our course. Write us and let us explain how you can qualify for a trained technical position without even giving up your present employment.

MAIL THE COUPON FOR FREE BOOK

Your name and address on the coupon will bring you by return mail our interesting free book, "Opportunites for Chemists" and full particulars about the course and what it will do for you. You owe it to yourself to get this book. Send the coupon right now while it is fresh in your mind. Or just write your name and address on a postal and mail it to us. But whatever you do, act today!

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New York, N. Y.

Please send me at once, without any obligation on my part, your free book, "Opportunities for Chemists," and full particulars about the Experimental Equipment given to every student. Also please tell me about your plan of payment.

NAME.....

ADDRESS.....

CITY.....STATE.....

A.S.-1-29

Don't Wait--Mail the Coupon NOW!

CHEMICAL INSTITUTE of NEW YORK, Inc.

16-18A EAST 30TH STREET Home Extension Division 1 NEW YORK, N. Y.

When I first started making real important money I used to go down to the bank, draw out a roll—and just thumb is over in my office and grin! That's how good it felt to get success and big money, after five years at a low-paid job.

Success and Big Money Were For Others, Not Me

Believe It or Not, That Was What I Thought of Myself—Just Twelve Short Months Ago

I'M telling you, just one year ago I'd never seen a hundred dollar bill in my life outside of a bank.

You'd think I'm kidding you if you saw the fine Radio business I own now. But it's gospel truth. Just twelve months ago I was only a poorly paid clerk, and I thought success had passed me by.

All my crowd in those days—the fellows I met in the pool-hall and at the bowling alleys—said a fellow had to *have* money to make money. They claimed there was no chance for a fellow whose family didn't have money or some business to start him out in. And I'd decided they must be right.

I guess at that time I had just about given up hope. I thought there must be some kind of a mystery about making a lot of money. But I was due for a big awakening.

Did I get it? Oh, boy! Read my story and judge for yourself.

IT all started one day last summer, when Helen, the girl I wanted to marry, was leaving for the seashore. Of course I went to the station to see her off.

As I stepped onto the station platform Bob Oakes and Wilmer Pratt had just rolled up in their cars. They climbed out with their arms full of bundles—books, expensive candy, flowers, all sorts of things. Well sir, I wish I could have swallowed in one gulp the little box of drugstore candy I had bought for Helen—it certainly looked pitiful beside all that stuff.

We three stood there talking to Helen until train-time, while Helen's mother looked me up and down. Like any young girl's mother would, she had my financial standing already sized up within thirty-five cents. Cheap suit, cheap hat, she took it all in. And you could see on her face all the time what a lot of nerve she thought I had to give Bob and Wilmer a run for Helen.

Well, to make a long story short, Helen was nice, but her mother stood there looking scornful whenever she glanced my way, and she hardly spoke to me at all. I felt about as welcome as the measles, and as uncomfortable as the itch.

I began to wish that I and my cheap suit and cheap hat could sink through the floor, but I stayed there and stuck it out.

WHEN Helen's train finally left, I slunk home, ashamed and humiliated. I went upstairs to my room and sat there with a lump in my throat, getting hotter and hotter and more ashamed of myself. Then I began to see red and redder.

Finally I jumped up and banged the table. "I'll show 'em," I growled through clenched teeth. "There *must* be some way for a man to make *real money!*" An idea suddenly flashed through my head.

Hastily I began thumbing the pages of a magazine on the table, searching for an advertisement that I'd seen many times, but passed up without thinking, an advertisement telling of big opportunities for trained men to succeed in the great new Radio field. With the advertisement was a coupon offering a big free book full of information. I sent the coupon in, and in a few days received a handsome book, telling about opportunities in the Radio field and how a man can prepare quickly and easily at home to take advantage of these opportunities. I read the book carefully and when I finished it I made my decision.

WHAT's happened in the twelve months since that day, as I've already told you, seems almost like a dream to me now. For ten of those twelve months I've had a Radio business of my own. At first, of course, I started it as a little proposition on the side, under the guidance of the National Radio Institute, the outfit that gave me my Radio training. It wasn't long before I was getting so much to do in the Radio line that I quit my measly little clerical job, and devoted my full time to my Radio business.

Since that time I've gone right on up, always under the watchful guidance of my friends at the National Radio Institute. They would have given me just as much help, too, if I had wanted to follow some other line of Radio besides building my own retail business—such as broadcasting, manufacturing, experimenting, sea operating, or any of the score of lines they prepare for you. And to think that until that day I sent for their eye-opening book, I'd been wailing "I never had a chance!"

NOW I'm making real money, own a good car, stand high in my town, can borrow money at the bank any time I want it. I'm getting some real *fun* and *enjoyment* out of life, not just *existing* from pay-day to pay-day.

And—just listen to this! Bob was in my place only the other day, and asked me for a job! Wilmer is still getting along pretty well on his father's money, but he'd trade places with me any day.

And Helen? Well—the honeymoon will be spent in Honolulu, starting two months from tomorrow!

HERE'S a real tip. Think it over—are you satisfied? Are you making enough money, at work that you like?

This new Radio game is a live-wire field of golden rewards. The work in any of the 20 different lines of Radio is fascinating, absorbing, well paid. The National Radio Institute—oldest and largest Radio home-study in the world—will train you inexpensively in your own home to know Radio from A to Z and to increase your earnings in the Radio field.

Take another tip—No matter what your plans are, no matter how much or how little you know about Radio—clip the coupon below and look their free book over. The information it will give you is worth a few minutes of anybody's time. You will place yourself under no obligation—the book is free, and is gladly sent to anyone who wants to know about Radio. Just address: J. E. Smith, President, National Radio Institute, Dept. 9-M2, Washington, D. C.

J. E. SMITH, President,
National Radio Institute,
Dept 9-M2 Washington, D. C.

Dear Mr. Smith:

Please send me your 64-page free book, printed in two colors, giving all information about the opportunities in Radio and how I can learn quickly and easily at home to take advantage of them. I understand this request places me under no obligation, and that no salesman will call on me.

Name .....

Address .....

Town ..... State.....

Bet you $150.00 (against a 2¢ postage stamp) I can make you a BIG MONEY Salesman!

Only this isn't a bet or a gamble—but a clean-cut sure thing business proposition. Read this guarantee of a million dollar institution. That we will make you a hard-hitting DYNAMIC Salesman—give you $150 for learning—under a money-back penalty of satisfaction of which you are judge and jury. Here is your one chance to learn selling and get into a real selling job without risking a penny!

$150 DOUBLE MONEY BACK BOND $150

A Positive Guarantee of $150.00 Earnings

++PLUS++

Absolute Satisfaction or Tuition Refunded

National Salesmen's Training Association

Incorporated as a School of Salesmanship

Chartered as an Educational Institution in 1907

The attached Application for Membership in the NATIONAL SALESMEN'S TRAINING ASSOCIATION is accepted with the understanding that immediately after you complete the lessons, sales talks, lectures, examinations, training in SPECIAL LINES, etc., which are included in the Course

WE AGREE that you will earn a guaranteed sum of at least **ONE HUNDRED AND FIFTY DOLLARS ($150.00)** in spare time employment with one or more of the great companies co-operating with us, provided you follow Companies' instructions in a reasonable manner and devote at least 100 hours to such selling work within 3 months after completing the printed portions of the Course.

WE AGREE if upon completion of the Course and availing yourself of all Training and Service privileges as outlined in this Application for Membership, you are not thoroughly satisfied, we will cheerfully refund to you the entire amount of tuition paid. You alone shall be the sole judge as to the worth and value of the Training and Service received.

FURTHER, MONEY BACK PENALTY

In the event that you do not earn the full sum of $150.00 in accordance with the above, or if you are not entirely satisfied with the Training received, *we agree to refund the entire tuition* on request, pro iding request for a refund is received within 30 days from completion of the conditions of this guarantee, and providing the terms of your Application for Membership attached have been fully complied with.

NATIONAL SALESMEN'S TRAINING ASSOCIATION

By Chas Michel President

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Chas Michel
President

National Salesmen's Training Association
Dept. 301A, N. S. T. A. Bldg., Chicago, Ill.

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City.....*State*.....

Occupation.....*Age*.....

VOLUME 3

AMAZING STORIES

THE MAGAZINE OF SCIENTIFICTION

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Extravagant Fiction Today - - - - - - - - - - Cold Fact To-morrow

AMAZING READING

By HUGO GERNSBACK

THE most surprising as well as highly amazing fact about human beings is that everything is taken for granted as far as the functions of their own bodies is concerned.

"Familiarity breeds contempt" is a well-known saying, and it is the very familiarity of all of our bodily functions which makes us look with contempt on what we term "simple" things. Nevertheless, it is precisely the simple things which are so difficult of comprehension that nobody can really understand them completely.

Reading provides a good example of this point. If you ask the man in the street *how* he reads, he will probably tell you that he knows all about it. The fact is, he doesn't know five per cent. of this most amazing function which is found nowhere in the animal kingdom, except in human beings. How do we read? Do we read letters, words, lines, paragraphs? No exact answer can be given. The child, being trained, spells out the different characters. Later on, through experience, a word is read as a symbol. After further experience, the eye take in practically an entire line, and some individuals actually taken in entire paragraphs, whereas a few less, who are known to have a so-called photographic mind, can remember an entire page just by looking at it once.

The average person believes that when you read, your eye starts from the left-hand side of the printed line and then scans continually to the right, and jumps back to the next line and so forth. This is not true. The next time you watch someone reading, you will find, if you actually observe the eye, that it moves in little jerks. There is no straight continuity. The movement is always in jerks.

All this sounds simple enough, but we are still miles away from the final act of reading. The eye may be termed a photographic apparatus, which sees what is put before it, comparable to a photographic camera. The impulses are then recorded on the retina and from thence on practically nothing is known of how we read. All this is an incomplete theory, for very few facts are known. We note that the light-impulses as they reach the retina are now "conveyed" in some manner through the optic nerve toward the rear part of the brain center which is known as the occipital lobes. And this is about all we know.

We have a number of different functions which make the reading act most complicated. Suppose that we admit that the words THE BIG BLACK CAT, let us say, after having been impressed on the retina, are now "sent" to the brain. But long before that occurs, something amazing and most marvelous happens. The light impulses spelling the words THE BIG BLACK CAT are not really registered at all in the brain as letters and words, but a most astonishing transformation takes place somewhere in our brain, whereby the letters and words are translated into something entirely new. Whether this is a picture of a big black cat or whether it is something else, no one can tell.

If you read a printed page of a book, you do not think in pictures; you think in *meanings*. This, itself, is something that is abstract and very difficult to explain. This single action is, as a matter of fact, so complicated, that volumes could be written upon it, without ever coming to any satisfactory conclusion. And what is more marvelous yet, after the words THE BIG BLACK CAT have been digested by the brain they are not immediately wiped out; they stay there. You can go on reading millions of other words and can at will bring back, through that other instrumentality, *memory*, the printed words that went on before.

You have to read a story only once, and if it is sufficiently interesting you will probably remember it the entire length of your life. Of course, in this case you do not remember words, or even sentences, but really a "translation," or transformation of it, in other words, the "sense" of the story.

All these complications, however, are child's play and simple when you contemplate what happens when you begin to read aloud what you see on the page. It becomes still more difficult when you play the piano or violin and read the notes and sing at the same time. So many actions and so many things happen in such a so-called simple process that it staggers the imagination if you try to puzzle out how it all comes about and what really happens to make it possible. In the latter case, for instance, the eye has to read notes and printed words simultaneously, and to send a message through the optical nerve to the brain. Here the brain has to translate and unscramble the message and operate a number of functions at the same time: first, the voice control enabling you to sing; second, the muscles of your hand, ordering you to play the violin; this is an infinitely complicated action, because both hands do not do the same thing, but act independently. In addition to this, the ear is now brought into play, because you must hear what you play, and if you play a wrong note, the aural nerve will immediately send a message to the brain to correct the mistake.

These things reveal to us some of the truly marvelous mechanisms of the human brain; and we are only on the threshold of things. A few hundred years ago, people did not read and write. If they did, it was in a sort of spelling out method, without the rapid continuity. As in a few years the human race has been elevated to this point, it would be difficult to say what is in store for humanity in the years to come.

It would not be surprising at all, if sometime in the future children were taught in school to read three languages at the same time, by having each line printed in three different languages. This is only a slight step forward and is only one of the wonderful things in store for the human race ahead of us. As a sample, I have reproduced a single line herewith, printed in three languages, spaced close together, the meaning being identical; the languages, first English, second French, third German.

If this sort of thing were practiced long enough, I am quite certain that many children could be taught three languages simultaneously, after having been acquainted with the fundamentals of the respective languages. Take the sample:

The night is still, the streets are resting.
La nuit est tranquille, les rues se reposent.
Still ist die Nacht, es ruhen die Gassen.

Mr Hugo Gernsback speaks every Tuesday at 9.30 P. M. from WRNY (297 meters) and W2XAL (30.91 meters) on various scientific subjects.

The WAR of the PLANETS

By Harl Vincent

Sequel to: "The Golden Girl of Munan."

I

IN a large airy room, handsomely furnished and decorated in the prevailing style of the better class apartments of the twenty-fifth century, sat a beautiful woman. The chair in which she reposed was deep-cushioned, and the luxuriousness of its upholstery had lured her to doze in its seductive embrace. Her eyes were closed, the long lashes sweeping cheeks of ivory. The rosy lips curved in a smile that bespoke contented dreams. A mass of red-gold hair tumbled about her head and shoulders in enchanting disarray, presenting an altogether beautiful picture.

Her dreams were happy indeed, dating back two decades to the year 2406 when she was but a young girl. The most frequently recurring theme was a panorama of the trip to New York in Professor Nilsson's aero, the Pioneer, leaving the watery grave of the island of Munan with Roy Hamilton at her side—dear Roy, who soon became her beloved husband and the father of their son Walter, now a fine upstanding young man of nineteen. Visions of their welcome in the metropolis of the world; of the happiness of her dearest friend Zora in the love of that other new-found companion, the professor—of the wonderment of the rest of their group at the new environment—all found a place in the fantasy.

This was Thelda, the "golden girl" of Munan, whose voice had called Roy and the professor to her far-off home and whose action in so doing had resulted in the annihilation of that terrible island and the consequent salvation of the outside world from the horrible destruction which had been planned by the Munanese.

The years had dealt kindly with Thelda. Her life had been so supremely happy since her escape from the island of hate, that not a wrinkle of care marred that beautiful face. Her contentment in the love of her husband and of their splendid son had served to enhance the loveliness which had first enthralled Roy. Indeed, to see her with her son, one would be constrained to think of them as sister and brother, rather than as mother and son.

HERE is a story of the future which we want to recommend to our readers. It is one of those stories just chock full of action, excitement, adventure and hero worship.

Once you get going, the action fairly makes every fibre in you tingle and makes your blood run faster. You won't be satisfied until the story has come to its conclusion; and then, as likely as not, you will mark up the magazine and you will find yourself drifting back to the story again, before you know it, and will read it once more, at leisure.

The smile on her face became even more happy as her dreams carried her along later years of the twenty that followed her marriage.

"Mother!" excitedly called out the voice of a clear-eyed, strapping youth who rushed pell-mell into the room. "Oh, I'm so sorry," he continued, observing her quick start, "I didn't know you were napping."

"Walter dear," she replied, as she sat erect and smoothed back her tumbled golden locks, "It is a happy awakening from happy dreams of the past to find you at my side.

"But what brings you in so obviously wrought up, Walter?"

"Oh mother, there is the most interesting news," said the boy, as he stooped for a hasty kiss and immediately rushed to a nearby table where reposed the videophone.

He turned a small lever labelled "General News," and immediately the voice of a news announcer filled the room while the disc of the instrument lighted brilliantly.

The scene in the disc was that of the dome room of a large observatory, where the astronomer could be seen at the eyepiece of his telescope.

"Now," spoke the voice of the announcer, "we have transferred ourselves to Castle Mountain Observatory, near Banff. It was from here that the first news of the strange manifestations in the heavens was given out, and the astronomer is now training his telescope on the locus of the phenomenon, so that adjustments can be made to permit the world to see for itself through the medium of the videophone disc.

Please stand by until the necessary connections are made."

"What is it all about, son?" asked Thelda in surprise.

"No one seems to know, mother. But, as near as I can make out from the public news video on the square, a large group of spherical objects has been sighted in the heavens about a hundred thousand miles from the earth. These are progressing in our direction at great speed and none of our astronomers are agreed as to their nature. The public ways are packed with people and everyone is greatly concerned."

"That is strange, isn't it?" responded his mother. "But if these bodies are already close to our earth, why is it that they were not seen before?"

"I don't know mother, unless it is because they came from an infinite distance and could not be seen by our most powerful telescopes while much farther away. And, though the first reports are most contradictory, everyone fears the worst. The people on the northbound moving ways are pushing and jostling and fighting to be first to get out of the city. As if it would do them any good to be in the open country if any calamity threatens our world from the heavens!" The boy's voice was scornful.

The movement continued until the electrodes became tangents to the circle formed by the three, all pointing in the same direction of rotation. The great blue flaming arc now became a whirling vortex, ever curving downward to the doomed city as the spheres tilted slowly, pointing their now white-hot electrodes toward the earth at an angle of about forty-five degrees.

AT that moment the news announcer's voice burst forth from the videophone:

"Connections have now been established with the great reflector at Castle Mountain. If you darken your rooms, you will find that the newly discovered phenomenon is dimly visible in the disc of your instrument."

Walter switched off the lights and drew two chairs close to the videophone.

Thelda joined him there and the two gazed intently at the disc.

The view was very indistinct at first, but, as their eyes became accustomed to the darkness, a small group of weird objects became visible in the center of the disc. These appeared to be a mass of closely associated spherical organisms, more like fish eggs than anything else to which they could be compared. However, they were not as closely packed. A noticeable space separated each globule from its fellows and, after watching for some little time, they observed that the positions of each were constantly shifting with relation to the others. They seemed to be floating in a mass, but aimlessly as regards formation—drifting hither and yon as if blown about by errant winds. The size of a single globe as seen in the disc of the video was less than a quarter inch in diameter.

The voice of the announcer droned endlessly as the two watched and listened in amazement:

"Measurements taken at this observatory show that each of these objects is four to five hundred feet in diameter. Were it not for the extreme power of this, the world's greatest reflector, the objects would scarcely have been located for another twenty-four hours. Their speed has been estimated as one thousand miles an hour and the present distance from the earth one hundred and eight thousand miles. If nothing occurs to alter their velocity or to deflect them from their present course, they will reach our earth in four and one half days. Speculation is rife as to what will happen if this transpires, but no satisfactory conclusion can be reached until it has been determined what the objects are. It is not considered probable that they are fragments of larger celestial bodies on account of their uniformity in size and their true spherical shape. Nothing definite can be said about it yet."

At this juncture their individual call sounded from the videophone and Walter flipped back the news lever to permit the incoming personal call to be made. The disc flashed brightly and the face of his father appeared.

"Hello, folks," spoke the cheery voice of the man they both loved, "Why in the world are you sitting in the darkness? Oh, I know—you have been listening to the absurd reports of some menace from the skies. Don't pay any attention to them. There is nothing to be alarmed about. But, what I called for was to tell you that I am leaving for home right away and that good old Prof. Nilsson is coming for dinner and is bringing Zora and Dorothy with him. That will please you I know, Walter," he concluded with a wink at Thelda.

"Why, that is lovely, Daddy," spoke Thelda, "I shall make arrangements at once."

"All right, dear. I'll be home in ten minutes, but I'm afraid we're going to have to keep an eye on that son of ours this evening," grinned Roy, "So long."

The disc went dark and the voice was gone.

Thelda snapped on the lights and when she turned to look at Walter she saw that he was blushing like a girl. She smiled inwardly, knowing that Walter's fondness for Dorothy, the daughter of Zora and the professor, had ripened into real love. Well, they would be a fine couple, a good match when the time came, she thought; this fine, black-haired, firm-jawed son of hers, and the petite, vivacious, blonde Dorothy would be very happy together.

II

WHEN Roy Hamilton left his studio that night he started for home with grave misgivings. He too had seen and heard of the strange happening that had suddenly been forced upon the attention of a peaceful and happy world. He had none of the confidence he had displayed when conversing with his family. But he resolved that he would do all in his power to keep Thelda from worrying. His son, he knew, would be intensely interested and no power on earth could keep him from learning all about whatever was going on. But Thelda, his 'golden girl' these twenty years, he would keep happy and contented—would shelter her from all harm with his own life, if need be.

During the swift trip uptown on the moving way, he considered some of the possibilities of the situation. What if these strange manifestations betokened the destruction of his world? If that was the case—well, they would all go together and probably nothing could be done about it. But, suppose the approaching objects were some sort of engines of warfare from another planet? This possibility had been suggested by the professor during their conversation a few minutes before, but Roy had scouted the idea. Why, scientists and astronomers were almost universally agreed that life on any planet in the solar system, other than the earth, was impossible. But, if they were wrong—then what? If it were conceivable that some such beings did exist and that they could make war on the world, what a defenseless planet they would find! Since 1950 all efforts of his world had been expended in peaceful pursuits. All weapons of warfare had been scrapped, all organized armies disbanded. It had been a happy period of four and a half centuries and more.

He could not convince himself that such a thing was possible or even probable, but he had a vague uneasy feeling that could not be shaken off. And, for some unaccountable reason, he kept associating with the present happenings the event of twenty years before—the destruction of Munan and his own part in its accomplishment. But that was absurd! What possible connection could there be in the two circumstances, so widely separated? Resolutely he threw off this mood as he left the moving way and proceeded to the entrance of his own apartments.

"Hello, dear," he cheerily greeted his wife, as she welcomed him with a warm embrace at the door, "Have

the Nilssins arrived yet? They should be here by now."

"No, they haven't. But Zora just spoke with me and she said they would be over in a very short time. I am awfully glad they are coming."

"So am I. Nils and I have not had a talk for a long time now and I am anxious to discuss Walter's future with him. By the way—where is Walter?"

Thelda smiled and pointed to the boy's own room. "He's in there, fixing himself up," she whispered, "And, do you know, Daddy, I shouldn't be greatly surprised if he proposes to Dorothy tonight. I have been watching them for some time and the signs are unmistakable."

"Well, nothing would please me more, dear. Of course they are quite young, but that is no objection in this day and age. They are undoubtedly in love with one another—have been since childhood—and their Board of Eugenics records are perfect. Between Nils and myself we could fix them fairly well to start their home and Walter could carry on with his studies as at present."

"Yes, Roy, I agree with you. In perhaps a year they should marry. But I must hurry and make my arrangements with the community commissariat so we can have our dinner in time."

She patted him on the arm and went into the next room to place her order over the videophone.

ROY looked grave for a moment, then stepped to the door of Walter's room and tapped on it softly.

"May I come in, son?" he asked.

"Sure thing, Dad," sang out the voice of the boy.

He entered, closing the door softly behind him. Walter was before the mirror, putting the finishing touches on his sleek black hair. Roy grinned understandingly as he crossed the room and put his hand on the boy's shoulder.

"Gee! I'm glad to see you to-night, Dad," said Walter, taking his father's hand in his own equally capable ones, "I'm much worried about this thing that's being reported by the General News Bureau."

"So am I, son. That is what has been bothering me too, and is the very thing I came to talk with you about. We mustn't speak too loudly, as I do not wish to alarm your mother."

"Neither do I, Dad. I hate to think of her worrying over so intangible a thing as this. And you know she will worry, not about herself but about you and me."

"That's just it, Walter, my boy. And, for no good reason at all, I have a strange feeling about the whole business. I fear it bodes no good."

"Me too," said the son. "But how are we going to keep mother from getting the news as it comes out?"

"I have thought of that and have already spoken with George Cox, who is president of the New York Theatres Company. He tells me that all news will be barred from the places of amusement in the entire city. So we are going to send your mother to the theatre to-night with Zora and Dorothy. You and I and the professor shall have the place to ourselves to talk things over."

Walter's face fell in disappointment but brightened at once as he realized the necessity of this move.

"That's a good idea, Dad," he said, and while they are out we can listen to the reports and discuss it with Professor Nilsson. He may have some theories himself."

"Yes, I believe he has," replied his father soberly, "But, let us join your mother now."

The two men—the son as tall and straight and handsome as the father—left the room and engaged Thelda in light conversation. She was in excellent spirits and evidently had forgotten all about the discomforting news of the early evening.

Dinner had been prepared by the servants from the commissariat, and soon their guests arrived.

Zora and Thelda embraced as only two such dear friends could greet each other. Roy took his old friend's hand in his and gazed deep into his solemn gray eyes. They gripped hard; harder than they had since the days of Munan. Dorothy and Walter were shy with the shyness that comes up suddenly between childhood sweethearts when they learn that love has come to them—real, grown-up love. Immediately the rooms echoed with the pleasantries and laughter of the six.

During dinner, at the first convenient lull in the conversation, Roy spoke up, "Well girls, I have a pleasant surprise for you. My friend, George Cox, presented me with three passes for "Thunder," the best show in town. Nils and Walter and I wish to have a little talk to-night about Walter's work in the laboratory, so you three are to take the tickets and enjoy yourselves in the theatre while we three discuss details that would be very dry and uninteresting to you."

This announcement met with instant approval by Thelda and Zora, though Dorothy blushed and stole a sly glance at Walter, who was staring fixedly at his plate. The two mothers observed this and exchanged meaning smiles.

III

WHEN the ladies were safely on their way to the theatre, the three men sat for a time before the videophone and listened to the latest reports. The view from Castle Mountain was very little different from that which had been observed two hours previously. Of course the strange objects were about two thousand miles closer to the earth, but this was so small a proportion of the total distance that no appreciable increase in the size of the little globes was seen. However, they seemed to have taken on a sort of sheen in the deeper darkness. This was not like the reflected light from planets and planetoids in the field of vision, but was rather an irridescence, a gleam of shifting colors foreign to anything else observable in the sky.

The announcer now dwelt mainly on the disorders which had broken out in many cities all over the world. He spoke of rioting in Denver, Buffalo, Copenhagen, and Alexandria, cautioning the people of the world to calm themselves and to remain in their homes for news, rather than crowding the public squares to listen to the reports over the public videos.

By this time the rotation of the earth had carried

the position of the traveling mass so close to the horizon that soon the Castle Mountain reflector would no longer be able to follow it. But the announcer reported that, as soon as connections could be made at another observatory where a view could be obtained, it would again be transmitted over the terrestrial videophone system.

Soon it was necessary to discontinue the view, but the voice of the announcer continued, tonelessly and tiresomely.

The professor gave a grunt of disgust and savagely bit the end from a fresh cigar. He sat up suddenly in his chair and exploded:

"Fools! They will have the whole world in an uproar. Why don't some of our efficient news censors put a stop to this travesty. Roy, if it isn't too much to ask, will you turn the darn thing off?"

Roy laughed, "My sentiments exactly, Nils. I was just going to propose that very thing. Let's do some talking instead. I'd like to hear your theories."

He touched the news lever and the video was silent. After turning on the lights, he returned to his chair and looked inquiringly at the professor.

"Well, how about it, Nils?" he asked.

Walter hung breathlessly on the professor's words as the reply came in measured voice:

"I am very much disturbed, Roy. And you, Walter, I wish you would listen very closely to what I have to say. Your work in my laboratory has prepared you to a great extent to appreciate and understand science and scientific reasoning, and I have a feeling that you are going to learn many things, during the next few days or weeks or months, which I could not possibly teach you myself. Of course I am merely going to theorize, but it seems to me that if our great astronomers would do a little more theorizing and a little less looking through their telescopes at this stage of the game when the objects can scarcely be seen, they would arrive at the same conclusion as I have.

"Don't laugh when I tell you I honestly believe that these seemingly small spheres now seen approaching our earth are space-traversing machines of some sort and that they are coming to us from another planet, quite probably with no good intentions."

"But, Professor," objected Walter, "the theory that life exists on other planets in our solar system has been opposed by our most eminent scientists for many centuries."

"I know it has, Walter. Nevertheless, that does not make the thing impossible. From your reading you must know that, as far back as the nineteenth century, some of the savants, notably Lowell, really believed that Mars was inhabited. Others said that this was extremely unlikely, but that there was a possibility of the existence of life on Venus. Later, as more and more power in optical instruments was attained, our astronomers began to think they were observing such detailed formations and making such careful and accurate determinations of atmospheric densities and constituents that they had definitely proved the non-existence of life on any of the other planets. Still I claim they can be wrong. What does the Castle Mountain reflector, the largest in existence, tell us of the possibility of life on a planet many millions of miles from us when it appears as a speck not over a quarter inch across, like an object that is four or five hundred feet in diameter and a mere hundred thousand miles away?"

"Come now, Nils," interjected Roy, "Surely you don't believe that creatures similar to ourselves can exist, say in the atmosphere of Mars? If I remember rightly, the gravity at the surface of Mars is only about one-third that of the earth, and the atmosphere extremely rare. Surely any beings existing there would be misshapen and entirely unlike ourselves or any earthly forms of life."

"Another fallacy," said the professor, settling back for a long talk. "That has been the reasoning of students for ages, but again I say they are quite possibly wrong in their conclusions. Not that it would make any difference in the present instance what the creatures look like, provided they possess a high order of intelligence. In fact, being warred upon by ugly, unspeakable monsters from another world, would be even more horrible to contemplate than if they resembled human beings.

"BE that as it may, I still maintain that life is possible on any of the planets—any of them. The two most likely ones are Mars and Venus, and I see no reason that has been or can be advanced which makes it impossible for beings, similar to us in all outward appearances, to live on either. Take Mars, for instance. Science has proved that its atmosphere is extremely rare, that its gravity constant is, as you say, about one-third that of the earth. Centuries ago this led to the conclusion that, if any higher form of life existed, the creatures must necessarily be of large size, with atrophied leg muscles; that they must be provided with huge barrels of chests to permit breathing the attenuated atmosphere; that their ears must be enormously large to permit of hearing sounds which are not readily conducted by an atmosphere of extremely low density. They tended to show that, with the scarcity of water on the planet, plant life was practically impossible and that living beings could not possibly contrive to get along in any great numbers, due to this scarcity.

"Again I say, they may be wrong. We all believe in God. Science has never disproved the essentials of His Word. We have all read that He created man in His own image. Many believe that the word 'image' here does not mean a physical likeness. Possibly it doesn't. But, suppose it does? Is there any reason He could not create, by a process of evolution, if you choose, a physical likeness under any possible condition? The likeness might be only external, it is true. But why the oversize lungs and chest? Why the spindly legs, the huge ears? A body cast in the same mold as yours or mine could easily have entirely different density, different specific gravity as a whole. Why could not the bones be larger in proportion, mere shells, so as to weigh much less with relation to the entire body? The very cells comprising flesh, muscle, skin, might well be larger—contain more air, less water. The den-

sity of the body might easily be a third of ours, did environment make it necessary. Lungs identical in size with our own could readily extract sufficient oxygen from any reasonable rarity of atmosphere were the rate of respiration increased proportionately. Or, even with the same rate of respiration, sufficient could be provided for a blood of different characteristics from our own—blood that would not require as much oxygen to perform its functions in a body with suitably altered chemical changes. Auditory nerves of vastly greater sensitivity than ours would eliminate the necessity for the grotesque ears. No, I claim that beings exactly similar to humans in appearance, with as great or greater brain power, can and probably do inhabit the planet Mars. In fact, their mental development is likely to exceed our own greatly, since Mars is a far more ancient planet and has had much more time for the evolution and education of its peoples, if such exist."

Walter listened attentively. Roy laughed, "Why Nils, I haven't heard you hold forth like this in years. I am almost tempted to start calling you Prof again. But go on. It is extremely interesting."

Unheeding, the professor continued, "As regards Venus, there are no such objections. Its size is almost exactly the same as that of our earth. Its atmosphere is similar in composition and density and is known to contain water vapor. Its gravity constant is about seven-eighths of our. Centuries ago there was some doubt as to its period of rotation about its axis. Now we know for a certainty that it rotates once in about twenty-four hours—that its day is almost exactly the same length as our own. The plane of the equator inclines to that of its orbit. Thus its seasons are similar to those on earth, though of shorter duration, since its year is but 224 days in length. The surface temperature averages about ten degrees higher than that of our earth, but that is not serious. All in all, it seems very simple to conclude that life does exist on Venus and that it is inhabited by an intelligent race of beings very similar to ourselves.

"Now, if we accept the hypothesis that life exists in intelligent form on one or both of these planets and that beings from one or the other are on their way to visit our earth, what may we expect? If these spheres approaching us are space fliers, peopled by such beings, they will be here in a very few days. If their mission is a peaceful one all will be well and we may benefit by it greatly. But if it is a warlike invasion—I shudder to think of the result. Still, 'Necessity is the mother of invention' and we might not fare so badly after all. However, they would surely cause great damage and loss of life before means could be found to conquer them."

The professor became silent. Thoughtfully he tapped the arm of his chair with his finger-tips.

"Do you really think there is the possibility of an actual 'War of the Worlds?'" eagerly asked Walter.

"Yes I do, Walter," answered the professor. "I cannot fully explain why I feel this way, but I have the most uncanny premonition of disaster from such a source that I simply cannot rid my mind of it."

Roy bent forward, startled. "Why Nils, I had the same sort of feeling this afternoon when I first heard the news," he said. "It is a strange coincidence."

The professor seemed much interested. "And did you think of Munan at the same time?" he asked.

"I did, and I thought it very peculiar."

The two gazed at each other in wonderment. They were remembering the telepathic faculties of certain of the Munanese. But Walter could not understand.

For two hours they discussed the problem—considered it from every angle—and when they had exhausted their ideas they were no nearer a definite conclusion than they were at the beginning. Walter could see only adventure in any of the possibilities that were suggested, but the older men viewed it with deep concern.

Shortly before midnight the ladies returned and the subject was dropped. The news lever of the videophone was not touched again that night.

Walter managed to get Dorothy aside and engage her in an earnest conversation. What was said at this time will never be known to any but themselves, but when they returned to the rest of the group, they were strangely silent.

The party broke up within an hour and cheerful and affectionate adieux were made. No further mention was made of the strange news of the day and, when they retired, Walter and his father congratulated themselves that they had kept from Thelda any hint of impending trouble.

IV

TWO nights later the same group was again gathered together, this time in the Nilsson apartments. And now there was no effort at concealment. There could be none; since the whole world was now apprised of the fact that some unknown danger threatened and that whatever happened would occur within the next sixty hours.

Thelda had laughed gleefully when she found that Roy and Walter had conspired to keep the thing from her.

"Why, Daddy dear," she had said, rumpling Roy's hair with both hands, "You forget my highly developed faculty of thought-reading. It is true that I have held it in abeyance since coming from Munan, but when you are troubled by anything, it always comes back to me. You were a dear for sending us out the other night, but I knew just how it was and how concerned you were. You should be punished, though, for thinking so poorly of my courage. Do you not remember the days in the cavern under Leyris, when all was in doubt, when we never knew from one day to the next whether we should leave Munan alive, whether we could save the world or not? Did I lack courage then?"

"Indeed you did not," replied Roy, contritely, "You were marvelous then, and still are. I was a fool to think that you would not take this heroically also."

"But I must confess that I am somewhat worried at that. If this thing does develop, as you and the professor seem to fear, it will mean a bloody war. Will it not?"

"I'm afraid it will, sweetheart. And probably a

more terrible war than has ever been fought on this earth—as horrible as would have been the vengeance of the Munanese. Having absolutely no weapons of defense, we should be at their mercy and if they wished to utterly destroy us they could undoubtedly do so."

Thelda sighed. "Then you, my dear, and our Walter also, would be compelled to engage in combat," she said with fear clutching at her heart.

"No doubt we would. But do not fret yourself about it—yet. We have no certain knowledge that our fears are to be realized."

The Videophone spoke: "NY-14-328, NY-14-328."

The professor hurried in from the next room as a stern but kindly face appeared in the disc.

"Professor Nilsson?" queried this gentleman; when he observed the professor approaching the instrument.

"Yes, Mr. Secretary. Can I be of service to you?"

"I believe you can. We have received a radio message at Washington from the invaders, and you are already involved. Can you leave for Washington at once and bring Roy Hamilton with you?"

"Yes sir," he responded, as he noted Roy's vigorous nod of acquiescence, "We will leave in the Pioneer within ten minutes and can be in Washington in about one hour."

"Excellent," approved the voice from Washington. "We shall await you in the Research building. Thank you for your prompt compliance."

The voice broke off and the face disappeared from the disc. This was the Secretary of Terrestrial Scientific Research, whose features were at once recognized by all present.

"Oh Dad, may I go?" asked Walter, at once.

The faces of the two women, Thelda and Zora, paled. They gazed at each other with stricken countenances. Dorothy rushed to Walter and buried her head on his shoulder.

Roy turned slowly toward Thelda and she answered his questioning look with a barely perceptible nod.

"Very well, son," he replied. "Make ready at once."

Tearfully hurried leave was taken and the three men rushed for the professor's laboratory, where his aero reposed in its cradle on the top floor. The Pioneer had been used very little since the trip to and from Munan in 2406, but the professor had worked on it from time to time, making alterations and improvements. Walter had never seen it and was highly elated at the prospect of traveling in the craft which had carried his father and the professor on their perilous mission so many years before.

The laboratory was reached in a few minutes and the men clambered through the entrance manhole into the ship and on to the control room. Everything was exactly as Roy had seen it for the first time twenty years before and he thrilled to the same old excitement when the professor clambered into the pilot's seat and turned the switch that started the sphere revolving. Walter watched in amazement as he followed the professor's movements at the controls and saw the electron-collecting cone swing around to a point under the rapidly revolving sphere to direct upon its surface the stream of waste energy which was to raise them from their position and carry them on their journey.

THE roof of the room in which the vessel rested had been slid back and, as the rotating sphere gathered speed, the Pioneer rose vertically, majestically soaring into the night above the great city of New York. Walter did not even go to the floor port-hole to watch the city slide away beneath them as they headed southward. He had seen this wonder too many times from the regular beam-lane liners and from his own small flyabout. Now he was far more interested in the mechanism of the Pioneer, which had always been such a mystery to him. For three years he had worked in this same laboratory with the professor but never until this night had he set eyes on the craft in which he was now being carried. Vaguely he understood that this ship did not depend on the energy carried by the regular beams which radiated to all points of the globe from his city, but obtained its power from stray electrons liberated by the losses of the regular energy systems. He had never understood the need for this but now he saw more clearly its advantages. They were absolutely free lances! Nobody could control their comings and goings and they would still have their source of power if something happened to cut off the regular energy.

While his father and the professor speculated on the contents of the radiogram and the reason for their call to Washington, Walter spent his time examining the mechanism of the ship and investigating her appointments from stem to stern. Although the professor had always maintained great secrecy regarding the Pioneer and had never explained its workings to Walter, he did not now deter him from pursuing his investigatory ramblings.

Traveling at a speed of five hundred miles an hour, it did not take them long to reach Washington, and the three stepped into the anteroom of the Secretary's office at the exact time promised by the professor.

They were admitted almost immediately to a large room where sat eight men before the screen of a standard news video. These were the Secretary and his advisory council of seven. Here the approaching objects in the heavens appeared much larger and more distinct than when they had last seen them. There seemed to be fully as many as one hundred and nine which had been counted by the astronomers. Now they looked like nothing so much as soap bubbles, truly spherical, and glistening with myriad shifting and shimmering hues. Beautiful they were, but in some unaccountable way awe-inspiring too. One could almost feel, in the air of the room, the menace of the weird objects.

Following mutual introductions, the Secretary handed to the professor a sheet of paper bearing the well known insignia of the Terrestrial Videophone Company. The three visitors read the message in silence. It was addressed to the President of the Terrestrial Government and read as follows:

"This is a formal declaration of war against the peoples of the world by the peoples of Venus. Munan

shall be avenged." The signature was a single word, "Mador."

Roy and the professor gasped when they read this.

"Now you see why I sent for you two gentlemen," spoke the Secretary, "The reference to Munan decided me."

"And a very good reason it was," replied the professor, "but let us think this over. What can be the meaning of that last sentence? And the signature seems to have a familiar sound, too."

"Why, Nils," Roy burst out, "Mador was the name often mentioned by the Munanese. He was one of their most noted scientists and was very close to the Zar. He was known to be working on some highly secret problem while we were there. But it could not possibly be the same, because none escaped when the island was destroyed."

The professor paled, his fine features taking on an expression of comprehension and consternation.

"It must be the same, my boy," he said haltingly, "I see it all now. Quite probably this scientist was working on the construction of a space flier while we were engaged in our plans to destroy the island and rid the world of its menace. It must be that he had started on this trial trip of the contrivance and was away at the time the island was annihilated. If that is the case he undoubtedly had a number of Munanese with him and when they returned to find their island gone they would quite naturally set out for one of the other planets. Reaching Venus, they set about to make allies of its inhabitants and to plan a war of conquest against us. Hundreds of duplicate fliers could well have been constructed during the intervening twenty years and this is the result. You see I was right in my discussion the other evening. Life does exist on Venus and we are to learn more about it, to our sorrow."

WALTER was bright-eyed with excitement, but his father shook his head gravely.

The Secretary spoke, "From your words I infer that this means a great deal to you; that you are greatly concerned. That is why I called you. Of course the entire world knows the story of the heroic efforts put forth by you and Mr. Hamilton in the Munan affair, but details are more or less forgotten in as long a time as has elapsed since that historic event. Now, with the knowledge possessed by you two regarding the activities of the Munanese, what can you offer in the way of suggestions as to a means of defense?"

"Mr. Secretary," the professor answered slowly, "That is a question that requires serious thought. Will you grant me until tomorrow morning to consider it?"

"Yes indeed, Professor. But do not forget that our enemies will be upon us at noon of the third day from this. You will have but little more than forty-eight hours in which to work. Possibly the world will again be compelled to rely upon you two to save it from disaster."

"We shall not forget the short time, Mr. Secretary. Roy Hamilton and I will do all within our power. On the face of it, it looks pretty hopeless, but we shall see. I do not have a single idea as yet but it is certain that, whatever may be done, it will have to be worked out in the laboratory. In order to be prepared, I should like to request that you place one of the official laboratories at my disposal with a corps of experts to assist me. Is this possible?"

"Most assuredly," agreed the Secretary, "The entire resources of my department and staff are yours. But there is one other question. Should I not order the videophone system discontinued on account of the possibility of the enemy overhearing conversations relative to the expected attack and to any defense plans which may be made?"

"Not at all," replied the professor, "Although we did receive a radiogram from Mador, you must remember that it was by the old code method and that he has no means of intercepting the standard videophone waves."

"But, Professor," queried the Secretary, "if the enemy can transmit radio messages, even though they be of the code variety, why can they not intercept our video, which, after all, is a means of radio communication, however advanced it may be over the ancient systems?"

The professor smiled. "I do not believe you have given that point the consideration it deserves, Mr. Secretary," he replied, "It is true that the videophone operates through the medium of high frequency radio vibrations but, as you know, the sound waves imposed on the carrier emitted from each individual video are distorted so as to be received on an ordinary radio as a garbled sequence of sounds, which have no resemblance to the human voice. As you are also aware, each video, though transmitting distorted sounds of a nature different from those of any other video, makes its connections through a central retransmitting office, where the individual distorted wave is rectified and 'undistorted,' so as to be properly received by the video to which the call is being made. Otherwise there would be no assurance at all of secrecy in any videophone calls between individuals. The only exception is the General News video which transmits a highly complicated distorted wave having such a characteristic as to be receivable by all individual videos. This too could not be rectified by any receiver not having the proper rectifying equipment. It is extremely unlikely, in fact I might say practically impossible, that the enemy is able to rectify these distorted waves and make them understandable, as there are an unlimited number of combinations possible in the distorting mechanisms. No, I think there is no likelihood of danger from that source."

"Professor," answered the Secretary, "I am absolutely chagrined at my failure to grasp so simple a problem as this, but in this time of stress and danger, I fear my mind is not working as it should. You are absolutely right about this as you have proved to be about many other things. Now, you will need a headquarters for your consideration of the main problem, and I wish to offer my home to you and your companions. Let us adjourn and leave for my residence at once."

THE Secretary conveyed the visitors in his small, speedy, private aero to his home in the outskirts of the city.

Washington was one of the few cities in the world that still retained the old arrangement of wide streets, spacious detached dwellings, and pedestrian traffic. Of course, there were landing stages on all buildings for the aeros, but there was none of the closely massed, continuous building construction with roofed-over multiple moving ways and artificial temperature control and ventilation encountered almost everywhere else in the world. Here one could look at the stars without taking a long elevator journey to the roof-tops of a completely covered city.

Roy, Walter and the professor were escorted to a spacious suite of rooms and there left to their own devices. The first thing they did was to establish a videophone connection with the professor's apartments in New York. All three spoke to their loved ones and were deeply moved by the expressions of fear in the gentle faces that appeared in the disc. The ladies begged to be allowed to join them in Washington, but Roy and the professor steadfastly refused, since they feared that the initial attack would be aimed at Washington, the seat of the Terrestrial Government.

Far into the night the three men talked, Walter being thrilled to the core at his thus having a hand in world affairs of such great moment. Finally the professor requested that the other two retire and leave him to his own thoughts. This they did reluctantly, though they fully realized that the professor's analytical mind could function much better in private.

V

NEXT morning Walter rose far earlier than was his wont and rushed into his father's room. There he found Roy already in the shower and in much better spirits.

"Walter, my boy," spoke Roy, after their good mornings had been exchanged, "I have already talked with the professor and he seems to be hatching a plan. He has not slept at all and has been working that wonderful mind of his to some advantage, I am sure."

"Oh, that's great, Dad," enthused the boy. "Won't it be marvelous if he can figure out some way of repulsing them?"

"It sure will," sputtered his father from the midst of the shower. "And somehow I can't help having confidence in good old Nils. Things looked just as black in Munan, but he solved the problem there. He is a wonder."

By the time Roy was dressed, they heard voices in the sitting room and they entered it to find the professor in conference with the Secretary and two of his aides. The professor had taken full control of the situation and a relieved expression on the Secretary's face had replaced his gloomy one of the night before.

The professor was speaking:

"Yes gentlemen, we are going to meet the enemy and see if we can discover the nature of their craft and the means of offense they are going to use."

"But how will you go?" asked the Secretary.

"In my aero, the Pioneer, the one from which we destroyed the island of Munan."

"But you may be shot down by the enemy before you can learn anything of value," the Secretary objected.

A mysterious smile wreathed the face of the professor. "I think not," he said, "And if you gentlemen are ready, let us go to the landing stage on the Research building and I will show you why."

They left at once in the little aero atop the roof of the Secretary's house. Soon they landed on the spacious stage on the Research building.

Walter cried out in astonishment when they landed, "Why, the Pioneer is gone!"

"Steady boy, steady," said the professor, with a triumphant laugh, "It's not gone. Don't worry."

He walked a few paces forward and stopped, beckoning the others to follow. When they reached his side he said, "Stretch forth your hands."

All did so, and reacted alarmedly as their fingers encountered a solid metal wall directly before them—a wall that could not be seen, though all objects on its other side were plainly observed, as if nothing intervened.

"This is the Pioneer," announced the professor dramatically.

"But we saw it last night," spoke Roy and Walter as one.

"Not its exterior," replied the professor. "If you remember, it was in darkness that we entered the craft. We felt our way to its manhole and it was not until we had lights inside that you saw anything. It was just as invisible last night as it is at this moment."

"Wonderful! Incredible! Astounding!" were the remarks of the Secretary and his aides.

"And now, let us enter," spoke the professor. "I will explain when we reach the control room."

He felt along the invisible hull of the ship with his fingers until he located the manhole, through which, one by one, he assisted the other members of the party. As soon as they were inside, they could see all details of the vessel as clearly as if there was nothing out of the ordinary about it at all.

"Now about our trip to meet the enemy," the professor began, when all were gathered in the control room. "As you have observed, this ship is absolutely invisible to the eye of man when viewed from the outside. Likewise, nothing that it contains can be seen unless you are within. Under such conditions I am sure we can safely go out to meet our attackers without their knowledge."

"But how on earth was this marvel accomplished?" asked the Secretary.

"You have undoubtedly read 'The History of Munan,' by Toros, one of the Munanese I brought back from the island?" queried the professor.

"Yes—years ago," was the reply.

"Well, in this book, as well as in my own writings, mention was made of the fact that Zar's aeros could be made invisible. This was accomplished by constructing the hulls from the metal munium, which was then coated with a secret substance applied like paint."

"Correct," the Secretary agreed in chagrin, "I had completely forgotten. That goes to show how soon one forgets the really important things of life. It is not very complimentary to your efforts, is it?"

"Merely human nature," commented the professor, "And to accomplish the same result as they did I have reconstructed the Pioneer since our return from Munan, making her hull from the same metal and coating it with the same compound. I had no particular reason for doing this, so must have been guided by good fortune. But you see I had brought samples of the metal and the coating compound with me, and I found that I was able to duplicate them in the laboratory. So here we are—fully prepared for our journey, excepting that we have no means of attacking our enemy. Unluckily, I have never been able to duplicate the liquid with which the crysinum bombs of the Munanese were filled. Some of its constituents were evidently available only on their island. Had we some of those bombs now, we could demoralize our foes in a few hours."

THE mechanism of the vessel was explained in detail and Walter drank in this information with as avid interest as did the Secretary's party. The fact of the stray electrons filling all space for thousands of miles around the surface of the earth impressed them all greatly—stray electrons lost from the energy systems of the world for centuries and available for use only by the professor's vessel. His invention of the peculiar metal alloy that made it possible to collect this lost energy and put it to work, gave them such a high opinion of his ability that their confidence in him increased each minute. As the crowning proof, came the clever adaptation of the principle of Flettner of the twentieth century—the collecting of streams of electrons and directing them on the surface of a rotating sphere, instead of using the winds on rotating cylinders as had Flettner.

"There is one feature of this attack which puzzles me," the professor continued, "And that is the comparatively slow rate of speed at which the enemy is approaching. I have not checked the position of Venus with the astronomers but I do know that it is about 26 millions of miles from us at inferior conjunction and 160 millions of miles at superior conjunction. If we assume that it is now, say 80 millions of miles away, the speed of 1,000 miles an hour would make the journey one of nearly ten years in length. This is obviously out of the question, so I assume that these space fliers are capable of much greater speed, probably as great as one hundred thousand miles an hour, or even more. Why then they are approaching at the slower speed is beyond me, unless it may be that they have figured on terrorizing our world pretty thoroughly before actually attacking. The radiogram seems to bear out this theory. What they probably did was this; they made the major portion of their journey in fifteen or twenty days; then, when within sight of our largest telescopes, they slowed down to the present speed with the idea of giving us four or five days in which to become utterly demoralized. And that is just about what we have become, judging from the reports of the General News Bureau—thoroughly demoralized."

"I believe your reasoning is sound, Professor," said the Secretary, "But now, if I may interrupt, what are your immediate plans?"

"Well, Mr. Secretary, I should like to leave at once with my two companions and some of your men and make a quick trip to look over this fleet. Possibly we can learn something of value. At least we shall know something of the nature of the approaching craft. We have provisions aboard, a videophone with the call "Special 28-A" and a beam transmitter—the one with which Munan was destroyed. The last will probably be of no value against this foe since it was designed to emit the proper frequency for setting off the crysinum bombs. However, we may just be fortunate enough to make a landing on one of the enemy craft, when our ancient hand weapons might be of some use. The main purpose of the trip though, is to reconnoiter."

"But can you make the trip quickly enough, and do your stray energies extend far enough into space?" the Secretary interrogated.

"Yes, indeed. Our maximum speed, after leaving the earth's atmosphere, is terrific. We should be able to meet them in about three hours and will then be something like fifty thousand miles from the earth. As far as the storage of stray electronic energy is concerned, I have calculated that this has now extended to a distance of no less than 300 thousand miles from the earth. In other words, it has filled space to a point some fifty thousand miles beyond our moon."

"Very well then," the Secretary decided. "Go ahead, Professor. And you may take my two aides with you. Will that be enough, or shall I send more of my men?"

"They will be quite enough," said the professor, "And I thank you, Mr. Secretary. We will keep in touch with you by videophone and report whatever of interest occurs. In the meanwhile, it is my suggestion that the general news reports be censored in order that the confusion and disorder now spreading over the earth be kept down to a minimum. You might even order the news people to use my name and that of Roy Hamilton. Spread a little propaganda. Recall the story of Munan and tell them that we are on our way to meet the enemy. I am not so egotistic as to feel that we are bound to be successful, but the effect of such propaganda will be beneficial, anyway."

"Your suggestion is very good," agreed the Secretary. "I will have it put into effect at once. Well, I can see you are anxious to be off. Here's my hand, and good luck to you. The whole world and its resources are behind you."

They gripped hands and the Secretary hastened to the manhole. When the final farewell was said and the manhole bolted shut, the professor returned to the control room where the rest of the group was gathered. Walter was impatiently awaiting the start. The two aides, Fred and George Bacon, brothers, were examining the machinery of the Pioneer with great interest. Both were scientists of world repute.

The professor's first action was to call the Castle Mountain observatory and obtain the exact position of the approaching fleet. He then pulled the starting

switch, adjusted the controls, and headed the Pioneer skyward.

Again they were off!

VI

WHEN the novelty of rising from the earth's surface at tremendous speed and of watching it change gradually to a huge bowl with the horizon as a rim, had somewhat worn off, Walter made for the videophone. "NY-14-328," he called.

Soon the voice of Zora answered and Walter spent several minutes apprising her of their plans. She took it all quite stoically and was particularly pleased that they would be able to keep in touch with the voyagers by videophone. After a few minutes conversation with the mother, Walter shyly requested that Dorothy be called to the instrument. When he viewed her sweet face in the disc, he experienced a sinking sensation and had his first doubts as to whether he quite liked this trip after all. His conversation with Dorothy will not be recorded, but be it said that he was a more solemn youth when he returned, albeit his eyes shone with an excitement other than that of adventure.

When he rejoined the rest of the Pioneer's crew they were more than three hundred miles from the surface of the earth and the speed had accelerated to nearly two thousand miles an hour. The upper limits of the atmosphere had long since been passed. No one spoke —all eyes were glued to the screen of the periscope. The only sounds were the slight hissing of the oxygen apparatus and the ever increasing whine of the revolving sphere. The needle of the speed indicator moved steadily to the right. Within ten more minutes it pointed to the figure 8—eight thousand miles an hour was their speed. And, less than an hour out, they had traveled 3,500 miles of their journey. The earth beneath them now showed as a true globe, a tremendous sphere showing the vast expanses of continents and oceans in splendid relief. When one and a half hours had passed, the speed of the Pioneer had increased to the incredible rate of eighty thousand miles an hour—more than twenty-two miles a second! Their journey was half over and the change in the whine of the sphere told the watchers that the professor had started the deceleration of velocity. The interior of the craft was uncomfortably warm, though the refrigeration apparatus was working to full capacity.

At this point the professor requested that Roy make a report to the Secretary and to their families. Walter followed his father in to the saloon, where the videophone was installed. It required but a few seconds to obtain the connection with the Department and when the Secretary's face appeared in the disc they saw he was smiling broadly.

"Well, I certainly am relieved to hear from you," he said, "We have been somewhat anxious, as we are all aware that the Pioneer has never actually traveled at the speeds necessary in this case. How are things going?"

"Fine, Mr. Secretary," was Roy's enthusiastic reply, "Professor Nilsson asked me to report that we are now 28,000 miles from the earth and that all is well."

"Excellent, Mr. Hamilton. And you may report to the professor that the video is spreading the news to the four quarters of the globe. The effect on the population has been electric. Rioting, which had reached serious proportions in some localities, has now entirely ceased. The people are clamoring for news from the Pioneer and I wish you would speak to them through the News Bureau. I will transfer the connection from here."

Almost at once the view in the disc changed, the face of Secretary Miller giving place to the view of a large room where sat several operators at control boards and where multitudes of microphones were grouped about a receiving videophone instrument. This was the first time Roy had spoken to the entire world and he was considerably embarrassed. Mastering his feelings, he was able to speak a few words:

"People of the world," he began, "I am speaking from the Pioneer, about thirty thousand miles from you. We are speeding towards the enemy at the rate of nearly twelve hundred miles a minute. Professor Nilsson is at the controls and if you could all know him as I have known him for twenty-five or more years, you would have the same confidence in him that I have. Remember, he saved the world once before. I was with him in Munan and have seen him at work on as bad a problem. I know he has the determination to win this time too and wish to assure you that if there is a man in the world who can ward off the impending calamity, he is that man. Keep up your courage as we are keeping up ours. We shall advise you of developments. Thank you."

The operators applauded in that control room thousands of miles away and immediately the scene shifted to again picture the smiling countenance of Secretary Miller.

"Fine, Mr. Hamilton," he said. "You could not have said anything more appropriate. Why, you have even instilled confidence in me. Good work."

"Thank you," answered Roy. "And now I should like to get in touch with my family."

"That's the thing to do," agreed the Secretary, "Don't let your wife worry. Good-bye."

THE next connection established was with Roy's own apartment and they found that Zora and Dorothy had joined Thelda there to keep her company during these trying hours.

"Hello, Roy," spoke Thelda's golden voice as the connection was completed and her loved face appeared in the disc. "Is everything all right with you and Walter?"

"Everything is fine," answered Roy, drawing Walter over so that he could also be viewed by his mother. "So far the trip has been a great experience, more particularly for Walter. He is enjoying every minute of it. And you know there is absolutely no danger in this expedition, since we can not possibly be seen by our foes."

"How long will it be until you reach them?"

"About an hour and a half, according to the professor's statement. The sensations when traveling at our

terrific pace are very novel and almost breath-taking. The effect of gravity has decreased so that we are moving about the ship like feathers in a breeze."

"It must be very interesting. But when you near the enemy fleet, be sure and keep close watch over our Walter, won't you?"

"You know I will, dear. And you folks take good care of yourselves while we are gone, too."

Walter then spoke to his mother and to Dorothy, after which the two returned to the control room and reported to the professor. There were no further calls and finally they sighted the enemy fleet far ahead. The Pioneer was slowed down and the professor made a wide detour to allow the mass of rapidly traveling enemy machines to pass on their earthward journey. They passed so quickly that none of the voyagers had a chance to get a good look at them and it was not until they had completely circled about and headed earthward in the rear of the fleet that they were able to examine the attacking craft closely.

The speed of the Pioneer was reduced to but slightly more than that of the huge spherical ships and they approached the rearmost of these very slowly. Each globe reflected lights of ever shifting hue and the similarity to immense soap bubbles became more apparent. The motion was absolutely steady and, for all its rapidity, seemed almost deliberate in comparison with the speed at which they had been traveling. No sign of life was visible at the distance of something less than a mile but, as they drew closer, the observers were able to make out a flat, railed-off sort of platform atop each of the globes. Aside from these the surfaces were absolutely smooth, showing no demarcations which would indicate that they were built up from separate sections. They appeared to be cast solid from some irridescent, highly polished material of unknown nature.

When they were within five hundred feet of one of the huge spheres which lagged somewhat behind the rest of the fleet, the professor carefully adjusted the speed of the Pioneer so that they seemed to be hovering directly over the observation platform below. All members of the party now clustered about the glass covered porthole in the floor of the control room, examining the curious craft closely. While they watched, a black spot appeared in the center of the platform. This immediately resolved itself into a circular opening and from it emerged a strange looking creature. At first they took it for some monster of inhuman mold, but it was soon apparent that this was a man, or a living being greatly resembling one, clad in a heavy suit of armor like a deep sea diver's equipment, even to the huge helmet surmounting the ensemble and the knapsack to furnish oxygen to the helmet.

Upon observing this, the professor grunted an exclamation.

"Roy," he said, "Take the controls, will you? I have an idea."

"Sure thing, Nils," agreed Roy, nothing loath. He took the seat just quitted by the professor.

Without further explanation, the professor disappeared into the rear compartment of the vessel and the group looked at one another inquiringly.

"Whatever he has up his sleeve," remarked Roy, "you can be sure it is going to be good. I have seen him work before, you know."

Walter's excitement was contagious. Fred and George Bacon could scarcely contain themselves either.

SOON the professor returned and the group let out a chorus of astonished exclamations when they saw him. He was accoutred almost exactly like the creature on the platform beneath them, excepting that he had not as yet screwed the helmet to the top ring of his air-tight suit.

"Roy," he said to the amazed pilot, "I am going to board that machine and see what I can learn."

"But Nils," objected Roy, "you will be killed and then what shall we do? Don't risk your life. It is the most important life in our world right now. Let me go."

"Nonsense," said the professor, somewhat testily, "I can take care of myself. And besides, I have this."

He displayed a small pistol-like contrivance which Roy at once recognized as one of the little disintegration-ray projectors which had proved so effective at Munan.

"Well, that makes some difference," Roy admitted, grudgingly, "But you must be very careful. Remember, the safety of the world is in your hands. Why, I am not even sure that I could pilot the Pioneer safely back to earth if anything happened to you."

"Oh yes you could, my boy. And now, will you please maneuver the ship to a point about twenty-five feet above that deck?"

As Roy complied, the professor gave his final instructions and soon revealed that the Pioneer was equipped with a number of features of which Roy had not previously known.

A light line was dropped to the craft beneath them and a hook at the end gripped the railing behind the sole occupant of the platform. After adjusting his helmet, the professor entered an air lock and the watchers again returned to the porthole. They did not know what to expect next.

For a minute or more they watched the movements of the figure beneath them in anxiety, momentarily expecting him to wheel about and discover the hook and line which to him would appear to extend from the nothingness of space above his head. But the man, for he was undoubtedly that, was busy taking observations with a sextant and suspected nothing.

Suddenly a thin pencil of purplish light shot out from the direction of the air lock and this struck the observer squarely between the shoulders. The travelers on the Pioneer, excepting Roy who knew what to expect, gasped in surprise when they saw the figure in the air-tight uniform wilt and crumple before their eyes. In less time than it takes to tell, the figure was entirely gone—disappeared into thin air, or rather into the vacuum of space, leaving nothing on the platform excepting the metal helmet, the sextant, and the heavy metal shoe soles. Bones, flesh, clothing—all but the metal parts—had been entirely disintegrated by the wonderful weapon aimed by the professor.

In a moment they saw a rope ladder slowly unfurl and leisurely descend to the deck of the great sphere. Fortunate it was for them that the enemy machine was of such huge size, for it had sufficient attraction for smaller objects in its vicinity to give them enough weight to be drawn to its surface. The professor then descended the ladder slowly and carefully, the watchers keeping anxious eyes on the opening into the strange flier in fearful expectation of another figure emerging from its depths.

Soon the professor reached the platform and his first act was to kick the helmet and the metal soles over the edge. These slithered slowly over the smooth spherical surface of the vessel and floated off into space. The professor then picked up the sextant and waved it as a cheerful signal to those above, though he could not see them.

He then peered into the dark circle which opened into the enemy vessel and, after a moment's consideration, descended into its maw.

"Well," said Roy, "Let's hope that everything goes well with him. He is, of course, a man of great resource and is armed with a marvelous weapon. The crew of the enemy vessel will undoubtedly be unarmed, since they could not possibly expect an attack from the rear. He should have a good chance, provided there are not too many of them."

Nevertheless the little group around the porthole spent an extremely anxious half hour awaiting his reappearance. Then came a shock. The Pioneer lurched and careened at a sharp angle. The vessel to which they were anchored had started off in a direction away from its fellows, and at high speed! They were being towed with it!

Not knowing what else to do, Roy threw the controls into neutral and let the Pioneer follow. When they had trailed thus for another twenty minutes and the remainder of the fleet was completely lost to view, the motion gradually decreased until they were floating in space, absolutely stationary. The Pioneer drifted at the end of the light line like a kite.

"NOW, what?" said Walter, nervously.

The others laughed. There was not much mirth in those hollow laughs though and, with white faces, they continued to watch the manhole below.

Soon a huge, metal-encased head appeared at the opening and a figure clambered laboriously to the deck. It was not the professor! The watchers groaned as one man. All was lost!

But no! Another figure emerged and this figure, for all the disguise of the uniform it wore, could be recognized as that of the professor. In his hand was the ray pistol, which he kept steadily trained on the broad back of the figure preceding him. A cheer went up from the four on the Pioneer as the professor waved his arm to indicate that all was well. He prodded his captive in the back with the pistol and directed him to the rope ladder. Keeping at his heels, he forced him to climb towards the Pioneer and the two made their way slowly upward until they were out of sight of the porthole. Roy rushed to the stern compartment where there were stored a number of the weapons like that used by the professor, and he armed himself with one of these also. The four voyagers stood at the inner door of the air lock and Roy trained his weapon on it when it opened to admit the professor and his captive. He kept the prisoner covered while the professor removed his own helmet and then assisted in removing the helmet and air-tight suit from the now unresisting enemy.

The prisoner was led to a chair in the saloon, where they were astonished to hear the professor converse with him in English.

"And now, my man, what is your name?" asked the professor.

"I know not of what advantage the knowledge is to you," haughtily replied the stranger, who was a heavy-set, broad-shouldered, blonde giant of a man, "but you may call me Kardos."

"All right, Kardos," snapped the professor, "You understand that you are a prisoner of war. Mr. Hamilton here, will keep close watch over you while I make the necessary arrangements to take your vessel to our earth."

"You're right I will, Nils," spoke Roy. "Just go ahead with whatever you have to do and I will blow this big boy to kingdom come, if he as much as moves a finger."

The professor busied himself in the storage compartments while Roy kept guard over the prisoner. The other three passengers sat gazing, with mixed hate and admiration, at the splendid specimen who sat now with his head bowed in his hands.

With a large coil of wire, a fair sized steel cable, and two ancient telephone instruments in his hands, the professor returned. He refastened his helmet and started for the air lock. With the exception of Roy, who remained with the prisoner, all returned to the porthole where they watched the professor make his way back to the enemy vessel.

He now made the connection between the two vessels more secure by means of the steel cable. There now extended the two tie lines and the telephone wires from the hull of the Pioneer to the huge sphere beneath them, and the professor disappeared once more into the interior of the enemy machine, carrying the end of the wires and one of the telephone instruments with him. It was probably fifteen minutes before he reappeared and this time his hands were empty. After he clambered up the ladder it was withdrawn and slowly the great, glistening globe receded from them as the cables and the telephone wires were paid out from above. The professor continued to let out the lines until some two hundred feet separated the two vessels and not until then did he reappear in the saloon.

After divesting himself of his unwieldy costume, he connected the remaining telephone instrument to the ends of the wires he had brought through sealed openings in the door of the air lock. This instrument was a curio, but the professor had a way of collecting and keeping such things, as he always figured that some time he might find use for them, however ancient their origin. The instrument, which comprised microphone

and receiver mounted on one curved handle, he thrust unceremoniously into the hand of Kardos, showing him how to hold the mouthpiece and receiver in their proper positions.

"Now Kardos," he ordered, "You will command your pilot to proceed earthward, accelerating gradually to a speed of seventy-five thousand miles an hour, then decelerating when further instructed."

Kardos glowered, but finally started to speak into the mouthpiece in a guttural, foreign tongue. The professor stopped him at about the third word with a sudden jab in the ribs from the ray-pistol, with which he had again armed himself.

"None of that," he rasped. "Speak English. You and your pilot both know it very well. There are going to be no conversations in your own language."

There was nothing for Kardos to do but comply, which he did with poor grace. His orders were obeyed at once, as was evidenced by a gentle tug at the Pioneer and a lifting of its occupants from their seats due to the acceleration.

With both the efficient hand weapons trained on the prisoner, who seemed to be taking his position more stoically now, the professor regaled his passengers with the story of what had transpired on board the enemy ship. They listened in amazement and were jubilant over the signal victory he had won, single-handed.

VII

BACK in Washington, Secretary Miller paced the floor of his office. About him sat a dozen or more of his men and the videophone had been constantly busy with calls from various other governmental Departments. He hesitated to call the Pioneer as he feared he might interrupt some of the professor's proceedings. But the voyagers were now gone nearly four hours and the world was getting impatient for word from them. The assembled company was almost in a turmoil, great men as they were.

The videophone spoke. Professor Nilsson's face appeared in the disc and the company was electrified into close attention. The Secretary answered with relief in his voice:

"What have you to report, Professor?" he asked.

"We have captured one of the enemy ships with all of its crew and will have it in Washington inside of three hours."

"What?" gasped the Secretary, "You have captured one of these huge fliers? How on earth did you do it?"

"Improbable as it may seem," responded the professor, "it was, in actuality, quite a simple matter. After passing the enemy fleet, we found that one of the vessels was somewhat behind the others and we approached this vessel closely. Our craft being invisible, we were able to do this unseen, although there was an enemy observer on a small circular deck on the upper surface of the sphere. To this small deck I dropped a line and a rope ladder from the Pioneer, which was kept in position by Roy Hamilton. It was necessary to do this very carefully so as not to arouse the observer and I was obliged to make away with him before crawling down the ladder and entering the ship through the air-locked manhole from which he had emerged. This was accomplished by means of an ancient weapon—the obsolete ray-pistol, you know—and this same weapon later enabled me to get control of the entire vessel."

"But," interrupted the Secretary, "how were you able to pass from one vessel to the other when both were in the vacuum of outer space?"

"I was enclosed in an air-tight suit with an oxygen supply system as was the observer on the deck of the enemy ship," the professor replied, "and fortunate it was too, since I was mistaken for the observer when I entered the ship and mingled with the crew. When I did show my true colors and turned the ray-pistol on the commander and his aides, they were so taken by surprise that I had little difficulty in getting the upper hand. Two or three of the crew endeavored to rush me, but, being entirely unsuspicious of any possible attack from the rear, they were unarmed, and after I had caused several of their number to disintegrate and vanish, the rest were so terrified by the ray-pistol as to be entirely tractable.

"It occurred to me at once that the commander-in-chief of the fleet would undoubtedly expect periodic reports from each of his vessels by radio, so, after locking all of the crew securely in their metal-walled quarters, with the exception of the commander and one of his pilots, I forced the commander to report that his ship was out of control and would be unable to keep up with the rest of the fleet. Fortunately the orders sent back from the flag-ship were to the effect that he should do the best he could and follow slowly, if necessary remaining in position until the fleet could return from its mission and salvage the disabled vessel.

"I then ordered them to slacken speed and the main body of the fleet was soon lost to view. The pilot I left on his own ship, after disabling the radio so that no further communication could be had with the flag-ship and, at the point of the ray-pistol, I forced the commander to return to the Pioneer with me. Leaving him under the guard of Roy Hamilton, I revisited the enemy ship and made steel cable and telephone connections between it and the Pioneer. I strapped the telephone receiver to the head of the pilot, who was so utterly cowed by the ray-pistol that he obeyed my every order, and returned to my own vessel. Then I forced the commander, Kardos by name, to communicate with his own pilot over my telephone connection and order him to proceed to our earth over a different route than that being followed by the rest of his fleet.

"This is now being done and the enemy vessel is towing us earthward. In order that the pilot of the enemy ship should have no opportunity of becoming unmanageable, I have sent your two men to the vessel and have equipped them with ray-pistols which they are keeping trained on him constantly. It is another fortunate circumstance that these spherical vessels of the enemy do not require the attention of the crew at the propelling machinery and can be operated by a single man from a central control room. We have had a little trouble with Kardos, but he has now resigned himself

to his capture and is as meek as the rest of the crew.

"We shall arrive at Washington at about two P. M. and I intend to take immediate steps to investigate the construction and armament of the great sphere in detail. With this machine in our possession, we shall be in a much better position and should be able to determine some means of combatting the others when they arrive."

"Wonderful! Professor, wonderful!" Secretary Miller said, with enthusiasm. "We shall inform the world at once. And now you had better get in communication with your families. No doubt they are as worried as we have been."

"We shall do that at once. Thank you, Mr. Secretary."

WHEN the professor's face vanished from the disc, the Secretary turned to the astonished assemblage.

"Why, this man is a marvel of courage and resourcefulness," he exclaimed. "He was never adequately honored for his wonderful work in saving our world from the Munanese, but I swear before you all that he shall be given his full measure of recognition this time. I have a feeling he is going to succeed again, too."

Murmurs of approval came from the prominent men present. The reaction from their recent gloom was slow in coming. It all seemed too impossible to be true. But they had seen the professor's face as he told them of his victory. They could not doubt his sincerity and, as quickly as the truth of his statements became impressed on their stunned minds, a great hubbub of triumphant exultation swept the room.

"Quiet, gentlemen, quiet," spoke the Secretary. "We have work to do. The peoples of the world must be apprised at once of the eventful happenings. It will keep them from further disorder and rioting, at least until the Pioneer returns with its war prize."

Immediate connection was made with the General News Bureau and the Secretary spoke to the world audience. He told in glowing terms of what had been done in the skies, fifty thousand miles away. So great was his own confidence now that, when he had warmed to his subject, he was able to communicate much of it to his billions of listeners. Where hope and despair had previously alternated, carrying the populace to hitherto unknown heights and depths, now only hope remained. Possibly he made them too optimistic, but the general result was excellent.

Thelda still entertained Zora and Dorothy in her apartments and the three women had also spent a very anxious three hours. The two mothers were calm through these trying hours, but Dorothy was inconsolable. After two hours had passed with no word from father or sweetheart she had buried herself in a divan and wept unrestrainedly. Time and again she begged permission to use the videophone and to call "Special 85-A" but the older women restrained her, fearing, as had the Secretary, that some serious plans of the adventurers might be interfered with. Just as they were about to give in to Dorothy's tearful pleading, having become more and more worried themselves as time passed, their own call was repeated and all three rushed to the videophone.

Dorothy was first to reach it and she laughed and cried in turn when the cheerful visage of her father appeared in the disc.

All three listened in wonder to his tale, as had the listeners in Washington a short time previously. Roy and Walter were called to the instrument of the Pioneer and the conversation took on the gladness of a reunion.

Dorothy's conversation with Walter was frankly that of a maid deeply in love. Neither seemed to care whether their elders overheard or not. Walter rather shamefacedly admitted that he had, so far, taken absolutely no hand in the 'big doings,' as he called them. But Dorothy would have none of his self-belittlement and assured him that he would yet be the hero of the whole affair. How near she was to the truth none of them realized at the time. When the connection was broken, the three women joyfully set out for one of the public squares. They felt the need of rubbing elbows with the people of the crowds which packed all such places, watching the public videos for reports.

They found the southbound moving ways unusually jammed for the time of day and a holiday spirit prevailed. Everyone wore a smile and the names of Roy Hamilton and Professor Nilsson were on the lips of all. They left the moving platform at 125th crossing and mingled with the crowd in Square T-17 on the sixth level. Here was a huge videophone screen, fully thirty feet in diameter, and the voice of a news announcer filled the entire area with natural distinctness, but amplified to such an extent that it completely overcame the crowd noises. Still it was not painful to the ear, but seemed rather to come fom a point immediately adjacent to the individual listener in ordinary speaking volume. The scene in the disc was again that through the Castle Mountain reflector and the three women thrilled with secret pride as they watched the drifting, weaving convolutions of the approaching fleet and realized that their men had recently left the vicinity of the menacing mass with a victory to their credit.

After a while the scene shifted to Washington, where the watchers were afforded views of the buildings and laboratories of the Research Department where preparations were being made for the arrival of the Pioneer and its prize.

Occasionally the view of a threatening radiogram from the enemy was flashed on the screen. Mador still persisted in his effort to terrorize the world in advance. But these messages, all signed by him, were greeted by hoots and jeers. The world simply refused to be further terrified since receiving the news from the Pioneer.

Impatiently as the crowd awaited the arrival of the adventurers in Washington, the time passed all too quickly for those most immediately concerned—Thelda, Zora, and Dorothy. The reactions of the crowd interested them more than the news. Their pride knew no bounds, though they remained unrecognized by those about them. This was a new experience for Dorothy and thrilled her to the depths of her girlish being. She had never been this far downtown in a public place

and, to her, it symbolized her parents' recognition of her grown-upness. No longer was she the school girl, to be pampered and sheltered, but a grown woman with a sweetheart, who was out there in the skies helping to make history.

Eventually the great moment arrived and the crowds in the square grew hysterical with excitement. The great sphere, behind which the tiny Pioneer was known to be trailing, had been sighted! The view in the screen was now that of an immense landing stage and soon the watchers could make out the approaching enemy vessel. The Pioneer was of course invisible but a brilliantly scintillating soap bubble seemed to be drifting in toward the stage. Larger and larger it loomed until its hugeness in proportion to the buildings and human figures in the scene became evident.

A resounding cheer rose from the crowd when the sphere settled to a landing and was blocked into position by scurrying figures of men who seemed like bees around a hive in comparison with its great bulk. Then, when a close-up was shown of the professor and his companions being greeted by the Secretary and his party, the crowds went absolutely insane with joy.

The three women had had enough. Elbowing their way through the crowd, they made for the northbound moving way and were soon following the news in the comfort of the Hamilton apartments. The excitement had been almost too much for them and, womanlike, they indulged in a good cry together. But they were happier than they had been in many hours.

VIII

IN Washington there commenced a period of activity, the like of which had not been seen in the world capital for many years. Dense crowds packed the vicinity of the stage where the vessel from Venus had landed. It was necessary to rope off a large area to keep the crowds from interfering with the removal of the crew of the captured ship. These were conveyed by fast aeros to Barranquilla, the sole remaining prison city in the western hemisphere. Kardos, the commander of the vessel, was held in Washington for further questioning, but it was soon found that no information of value could be obtained from him. In fact his replies to the questions of his captors were so misleading as to be of less than no value. The professor therefore decided that personal examination of the mechanism of the space flier was the only means of learning its workings and of discovering what weapons the attackers would employ in warring upon the world.

With a corps of Research Department men and with Roy and Walter as his lieutenants, he set about the difficult task. When the last of the crew had been removed, they entered the vessel and started a minute examination of its machinery and of the materials of construction.

Measurements showed the sphere to be 481.6 feet in diameter and the thickness of its shell 13.2 feet. It appeared to have been built in one piece from some tough, strong material, a section of which was cut out for analysis. The inner surface of the shell was lined throughout with an unknown metal of the thickness of three-tenths of an inch. The purpose of this lining was not immediately evident, since it was not of sufficient thickness to add anything of strength to the tremendously thick outer shell. At the lowermost portion of the vessel was the control room. This contained a complex arrangement of electrical controls and seemed to be the center of all activities necessary for the operation of the ship and of its offensive weapons, whatever they might be. The crew's quarters occupied the level directly above the control room, the rest of the huge sphere being crammed with floor after floor of electrical machinery and mechanisms of a nature entirely unknown to the scientists now on board.

Though opaque and apparently of the same material as the remainder of the sphere when viewed from outside, the entire outer wall of the control room was transparent from the inside, giving an unobstructed view to the pilot.

Careful tracing of the wiring disclosed which of the mechanisms provided the motive power. These were not examined at once, since the important thing was to determine the means of offensive warfare to be encountered. It was soon apparent that the driving mechanism was but a small part of the machinery of the vessel and this seemed to incorporate some simple means of nullifying gravity in any direction with elaborate control of this effect to provide for steering. The rest of the vessel was a huge power plant for generating electricity at tremendous voltage, but the method of application of this power could not be discovered.

The means of starting and bringing this immense power plant to speed was soon determined but, when the scientists had accomplished this much and found that the voltage generated was of the order of three million, they could not discover how this great potential was handled or applied. True, they traced the output connections but this did not prove of much help, for one terminal of the great transformers was connected with the metallic lining of the hull, while the other terminal connected with one great metal cylinder about fifteen feet in diameter. The metal cylinder was solid and was set in the hull through an insulating bushing with its axis mounted radially with reference to the vessel itself. Further examination revealed that this metal cylinder could be moved in or out by means of a motor-driven rack and pinion mechanism. When moved forward to its greatest extent it was found to project some seventy feet outside the hull, exactly at the equator of the immense ball. But when the power was full on there was absolutely no indication of electrical discharge from the electrode, though the voltage differential between it and the lining of the vessel was found to agree with that shown on the meters in the control room. Tremendous power there was here, but neither the professor nor any of the other scientists were able to learn how it could be applied as a means of destroying life or property.

The remainder of the day was spent in futile research along these lines and, late in the evening, the professor left the Research Department experts on board the vessel and repaired to one of the laboratories with the

samples of various materials of which the ship was constructed. He was considerably discouraged, and asked Roy and Walter to remain with him during the experiments which he was about to conduct. This they were only too glad to do and Walter eagerly set about to help. As an assistant to the professor he was almost perfect, the carefulness and accuracy of his work having been always noted and approved by that great scientist.

Far into the night they worked and many of the materials had been completely analyzed and classified. The most surprising thing to the professor was the composition of the hull. This proved to be built up of thin fibrous sheets, similar to ordinary pulp paper, impregnated with a phenol-resin compound and united in a solid mass under heat and tremendous pressure. This was nothing more nor less than an insulating material used extensively on earth and designated by various trade names such as Bakelite and Micarta.

THE following morning, with the world clamoring for news, the professor had nothing of interest to report beyond the general details of construction of the enemy vessel. His efforts at seeming cheerful were successful, however, and there was as yet no renewal of the widespread discouragement and alarm that had followed the first news of the approaching enemy.

His next experiments were with available destructive agencies and their effect on the huge bulk that reposed on the landing stage. The world was sadly lacking in such resources, all arms and ammunition of any size having been scrapped and gone these many centuries. However, there were the energy beams by means of which all power was transmitted and these were the first to be tried. Centuries ago, when the transmission of power through the ether had been perfected, it was possible to destroy battleships of the ocean and air by merely directing beams of great energy into their machinery which thereby became paralyzed, making the engine of war useless. This had been one of the primary reasons for abolishing all war from the face of the earth.

It was quite reasonable to suppose that the same procedure might be successful against these warships from another world, but the professor had his doubts. He knew that the Munanese were fully aware of this ancient method of disabling combatants and, as Mador had been one of their best known scientists, he would undoubtedly be prepared for the use of energy beams by the otherwise unprepared peoples of the earth. He was not wrong in this assumption, as the first experiment showed.

From the Thomas Energy Company was obtained the use of the most powerful beam transmitter in Washington and, with all the machinery of the enemy vessel in full operation, the energy of this beam was directed into the ship's vitals. There was no effect whatever, the high speed machinery of the vessel continuing to hum musically—the many electrical instruments in the control room being unaffected in their indications.

"Just as I feared," the professor muttered, "The metallic lining evidently forms a protective shield, though our ancestors were never able to find a material which would successfully defy these same energy beams. And now, gentlemen, we must get busy in earnest. I must make a hurried trip to New York to bring certain materials from my own laboratory. I shall be gone no longer than two or three hours. In the meantime Roy and Walter will remain with the rest of you and assist in a thorough search through the enemy ship. Possibly you may find printed instructions somewhere among the effects of the officers, and even if they should be in the language of the Venerians, we should be able to have them translated in time to be of some value. We have enough experts here in Washington."

Before he left, he called for Walter to give him instructions as to his part in the work, but Walter was nowhere to be found. Abandoning the search after a few minutes, the professor started for his own laboratory without giving the matter much serious thought.

IX

THAT day was a very trying and discouraging one. When the professor returned from New York with a load of his own paraphernalia, he found that nothing of value had been found on board the enemy ship. Not only that, but Walter was still missing. Roy and he were much alarmed but it was necessary to keep on with the work. They could not let up for a minute now—the time was getting too short. By noon of the morrow the enemy would be upon them and nothing had yet been accomplished.

Roy and the professor spent all that day and night in the laboratory, conducting experiments with the various materials from the space flier, but still had nothing to report on the following morning. When day broke and the News Bureau could tell of no progress, the public again became clamorous. Castle Mountain reported the fleet only six thousand miles away and still maintaining the speed of one thousand miles an hour. They would arrive before noon! And the world was still helpless!

More of the threatening radiograms began pouring in from Mador. Public excitement again increased to fever pitch and, as the morning wore on, the great cities of the world began to take on the appearance of ant hills. With fear overcoming all reasoning power, the people lost their heads and started a disordered flight to the open country. This was the worst possible course they could pursue, though it was quite certain that the larger cities would be the first points attacked. However, the open country presented no opportunities for shelter or for obtaining food. All population being now concentrated in the cities, and all foodstuffs being synthetically produced therein, the countryside was deserted and wild—the farms of the ancients gone and now overrun with wilderness and wild beasts. Still the exodus grew in importance and extent, spreading to all the cities in the world.

Secretary Miller had been called to account by the President and soon hunted out the professor to learn what was being done. He found the professor in a

state of deep gloom. He had been entirely unsuccessful and was compelled to report that he could hold out no hope. Further than this, Walter was still missing and the professor's heart was also heavy on this account. Thelda had learned of the fact and had just communicated with Roy, displaying great fear and nervousness. It was indeed a trying situation.

In a few hours videophone reports began to come in from all over North America. The enemy fleet had spread out in groups of three spheres each and these groups had appeared over many of the principal cities. They drifted at an altitude of about five thousand feet and showered the various localities with radiograms. Their own radios were unable to rectify the distorted waves of the videophone beams—they could communicate only in the now little used code radio. Fortunate this was, for they were thus unaware of the capture of one of their ships and had no knowledge of what was transpiring on earth.

But the campaign of terror was effective. The people were absolutely unmanageable and the casualty lists lengthened rapidly. Where Professor Nillson had, but a few hours before, been a world hero, now curses and invectives were heaped on him by the unreasoning mobs. Roy was unswerving in his loyalty and the Secretary and his entire department continued to back him. Feverishly they worked on board the enemy ship and in the laboratories.

At one P. M. came news of the first hostile attack. Cincinnati had been completely wiped out of existence, inhabitants and all. The few who had escaped to the open country would surely starve or be destroyed by wild beasts. Reports of the catastrophe were cut off short before any details could be given, for the local videos went the way of everything else in the city.

The next radiogram from Mador warned that Youngstown would next be destroyed. The inhabitants of that city fought and struggled to reach the country and many fatalities resulted before the enemy even arrived.

Thelda had been prostrated by the continued absence of news from Walter and it was with dragging feet that Roy followed the professor to the Pioneer. It was decided that they should make a rapid trip to Youngstown to watch the enemy at work and learn how the destruction was accomplished. A dozen scientists from the Research Department embarked with them, as did Secretary Miller.

CLIMBING rapidly to an altitude of ten thousand feet, the Pioneer headed for Youngstown with the driving sphere whining in ever-rising crescendo. So rapid was the acceleration that they had not been in the air more than ten minutes when the interior of the vessel became so hot they could scarcely bear it. Fifteen minutes, and with the prespiration pouring from his face and body, the professor reversed the sphere. Ten more minutes and they were stationary, far above the doomed city. This was the fastest trip the Pioneer had ever made in the lower atmosphere and its refrigeration system had been taxed to the utmost. So had the stamina of its passengers.

In silence the professor uncovered the floor ports of the Pioneer and in silence the fifteen passengers knelt about these glass covered openings. Far below them spread the industrial city, with the forms of the spherical ships about half way between. They had huddled together like billiard balls set up in equilateral triangle formation. The hulls seemed to contact momentarily. As they did, from each there slowly projected a dark object, cylindrical in shape. These objects approached each other in the open space enclosed by the three vessels. They contacted and a blinding blue flame spouted at the point of contact. At this, the three ships rapidly receded from one another, but the arc which had formed between the three electrodes continued, spreading to a huge, sputtering, roaring flame as the distance increased.

The roar of the tremendous arc increased to such an intensity that it became audible even through the double hull of the Pioneer. The passengers watched in awed silence as the three enemy ships, still maintaining their triangular formation, receded to three points equally spaced about a circle enclosing the city. Still the terrific arc was maintained between the electrodes. When the outermost limits of the city had been reached, the three vessels started to turn slowly on their vertical axes. This movement continued until the electrodes became tangent to the circle represented by the three, all pointing in the same direction of rotation. The great blue flaming arc now became a whirling vortex, ever curving downward to the doomed city as the spheres tilted slowly, pointing their now white-hot electrodes toward the earth at an angle of about forty-five degrees. The ground below was completely obscured from view, but the din of a roaring cyclone and the rending of solid masonry and steel girders came plainly to the ears of the spectators. It was a white-faced group that stared wonderingly at each other when the arc abruptly ceased and the desolation of a city completely wiped out of existence was presented below. The three enemy vessels rejoined and made off towards the north in a leisurely manner.

The professor jumped to his feet. "The atomic storm!" he shouted, "Why did I not think of it before? It was produced on a miniature scale in the laboratory as far back as the twentieth century, and in an electric arc, too. But what are we going to do to fight it?"

The scientists were still too much shaken by what they had witnessed to even think clearly, much less to discuss the problem. Roy's worry over Walter's disappearance kept him mute and downcast, also. So it was a gloomy party that disembarked from the Pioneer at the Research building in Washington forty minutes later. They repaired to the Secretary's office at once.

X

ZORA and Dorothy had remained with Thelda, and were doing their best to comfort her, though Dorothy was in almost as hysterical a condition as the mother. They had just received news of the loss of the city of Youngstown when the videophone again spoke. In fear and trembling Dorothy answered

but her fear changed to joy when Walter's face appeared in the disc. Thelda swooned when Dorothy shouted out the good news.

"Oh, Walter," said Dorothy, with a sob in her voice, "We have been so worried about you. Why didn't you let us know where you were?"

"I'm awfully sorry, darling," he replied, "but I am all right. I am in the Museum of Ancient History here in New York and have been so absorbed in what I was doing that I did not even note the passing of time. And I must rush back to Washington. I think I have found the way to repulse the enemy."

"Oh, Walter dear. That is marvelous. Do hurry. I will advise Washington right away that you are coming."

"All right, darling. I'll rush to the aero terminal while you do that. Tell mother not to worry, won't you?"

"Yes dear. And I'm sure she'll recover now right away. And sweetheart," she continued, shyly, "I'm awfully proud of you. I just knew you would do something wonderful."

Walter laughed boyishly and with a cheerful farewell was gone. Dorothy spread the glad news through the apartment and the tonic effect on Thelda was immediate and complete. She laughed aloud in her relief and joy, as Dorothy returned to the video to spread the news still further.

Secretary Miller sat at his desk in conference with Roy and the professor when the call came from Dorothy. They had just about given up hope of coping with this terrible enemy. Reports had come in of the destruction of two other cities, Houston and San Diego. The whole world was in chaos. All had given up hope. But the videophone system had been kept intact, the operators remaining heroically at their posts. The beam lane aero lines still maintained service, though few cared to travel. Otherwise all business and industry was at a standstill. The cities were gradually becoming deserted, great numbers of the population streaming out into the wilderness with what few belongings they could carry and with no attempt to hide their fear and utter demoralization. Reversion to savage instincts had already begun to crop out in certain sections.

Roy and the professor shouted with joy when Dorothy's sweet face appeared in the disc, and the room echoed with rejoicings when her news of Walter was repeated. The group of scientists babbled excitedly when they learned that Walter was on his way to Washington and claimed to have solved the problem with which the world had been so suddenly confronted.

"But can it be possible that this mere boy is right in his statements?" queried the Secretary.

"It would not surprise me at all," the professor replied, "He is a great student and has a marvelous memory. He has worked with me for some time, you know, and, although still very young, he has already made several important scientific discoveries. What he has done, no doubt, is to pore over some ancient volumes in the museum to see what he could learn of the old arts of warfare, and has stumbled on to something."

An hour and a half remained before Walter would arrive and the group in the Secretary's office waited anxiously. No further news there was of further destruction wrought by the enemy, but a constant stream of Mador's haughty radiograms poured in. All of these referred to the final vengeance of Munan. All pointed to a long drawn war in which the enemy intended to take their own sweet time and to make the destruction of the earth's civilization as leisurely and harrowing as possible.

Finally Walter burst into the room and, unceremoniously, rushed to the Secretary's desk. The professor rose to his feet and clasped the hand of the flushed and panting youth. Roy hugged him to his broad breast in sheer delight at knowing he was safe.

"WELL," asked the professor, "What have you found, my boy?"

"The secret—and no mistake," answered Walter, proudly, "Your discovery that the hull of the enemy ship is made from phenol-resin impregnated fibre set my mind to work. I remembered dimly having read something regarding certain old experiments with the material Micarta, so I rushed to New York and started looking for the information. It was necessary for me to read completely through sixteen musty tomes, but I found it. Here it is."

Dramatically he laid a sheet of white paper on the desk.

With trembling fingers the professor picked this up and read aloud the copy made in Walter's careful hand:

"During recent years it was found in the research laboratories of the large electrical manufacturers that micarta and asbestos could be made to explode violently when subjected to high frequency current. The time required varied from one-half a second to about thirty seconds. These experiments were discontinued, since no particular value was attached to the discovery, it being one for which no practical use could be found."

The professor looked up solemnly.

"He has found it all right," he stated. "This boy has done what none of us have been able to do and the world surely will owe him a debt of gratitude. But we must hasten. There is still much to be done. We must experiment this very night on the three enemy craft now hovering so menacingly over Washington. Have I your permission to proceed, Mr. Secretary?"

"Indeed you have," replied that official wearily, but with new hope evident in his voice. "Go the limit."

The professor again became the human dynamo. He issued his orders with celerity and decision. The scientists started on their several missions eagerly. None questioned the superior knowledge and ability of this man, who had once before saved the world from as great disaster as now threatened.

The Pioneer again was the scene of activity. The professor with Roy, Walter, and Secretary Miller, reached the staunch craft just as one of the aeros of the Thomas Energy Company landed on the stage of the Research building. From this aero two of the Secretary's men emerged and with them were half a dozen of the Thomas men carrying between them two

small but complicated electrical mechanisms. These were hustled into the Pioneer and placed in accordance with the professor's instructions. While supervising the work he talked incessantly, as was his habit when working out the details of some problem.

"These, gentlemen," he commenced, "you will recognize as standard beam transmitters. We shall place one in the stern compartment and one in the control room. With these we shall be able to project two beams in any desired direction, each beam capable of ionizing the air for a distance of at least ten miles. Since we have no collector on the enemy craft tuned to the proper frequency we shall have to set up our own current in the material of their shells. We do not even know the exact frequency required, but that will be easy to ascertain.

"We are soon to receive a generator capable of producing supersonic frequencies as high as half a billion cycles per second, and we shall simply run it through its range of frequencies until we find the proper one. With our two beams of ionized air we have two electrical conductors over which we can transmit the high frequency current and with both beams in contact with one of the spheres we shall have a complete circuit. When the proper frequency is determined we shall be able to subject the micarta-like shells to a continuous current of this frequency. The very dielectric losses of the material will prove its undoing. Molecular friction. You see, the molecules become charged first positively, then negatively, with the reversals of current and shift their positions in the mass correspondingly. When the frequencies of the reversals becomes so great as to set up a terrific internal heat due to the friction between the rapidly shifting molecules, the resulting expansion is so sudden that disruption is bound to occur. I hope that a tremendously violent explosion will result."

He was like a boy in his enthusiasm and when the high frequency generator arrived he personally supervised its installation. By nine that evening all was in readiness and the Pioneer took off. The moon was very brilliant and they could plainly see the three menacing globes hovering high in the sky. One of these they passed so closely that they were able to hear the throb of its machinery. But they continued straight up until about ten thousand feet above the nearest of the invaders. Here the professor stabilized the Pioneer and left it hovering while he proceeded to the business at hand.

THE enemy ship, though nearly two miles beneath them, still appeared as a great ball, reflecting the moonlight in myriad hues and tints. It was with keen satisfaction that the professor observed Walter's excitement as he was given charge of one of the beam transmitters and was instructed in its use. This one was tested first and the faint purple haze marking its pencil-like beam was observed to move over the landscape below at the will of the operator. The second one likewise tested out satisfactorily and Roy was stationed at this.

At the professor's direction, both rays were trained on the globular ship below and two small purple spots felt their way over the upper surface until they reached opposite sides of the ball somewhere near the equator. There they rested, all unknown to the beings within.

Not until then did the professor start the high frequency generator and impose its current on the two conducting beams, but when this was accomplished to his satisfaction all on board held their breath in eager anticipation. What if the experiment were to prove a failure after all?

The hum of the generator increased gradually in pitch, gliding smoothly up the scale of musical frequencies until it became a thin, fading scream. Then it disappeared entirely and the silence was so intense that each of the watchers became aware of the throbbing of his own pulse. The frequency indicator mounted to greater values and still there was no result below. As time passed and nothing happened, one of the men groaned. At that moment Walter exclaimed excitedly:

"Professor! The purple spots are changing color. Hold the frequency at this point."

The professor adjusted the control to maintain constant frequency and he marked the spot on the indicator so as to be able to return to it again. All watched breathlessly as the two tiny purple spots changed to a bright orange, spreading rapidly in size. In less than ten seconds the great ball was a beautiful pyrotechnic display. Silently, majestically, it spread into a magnificent sunburst, lighting the countryside for miles around and showering it with numberless incandescent fragments. Seven seconds it took for the sound to reach them—then the Pioneer was rocked by the force of such a detonation as had never been heard by any of the passengers. The sound was as of a terrific thunderclap, close by, and the commotion in the atmosphere threatened to upset the vessel. Then all was again silent.

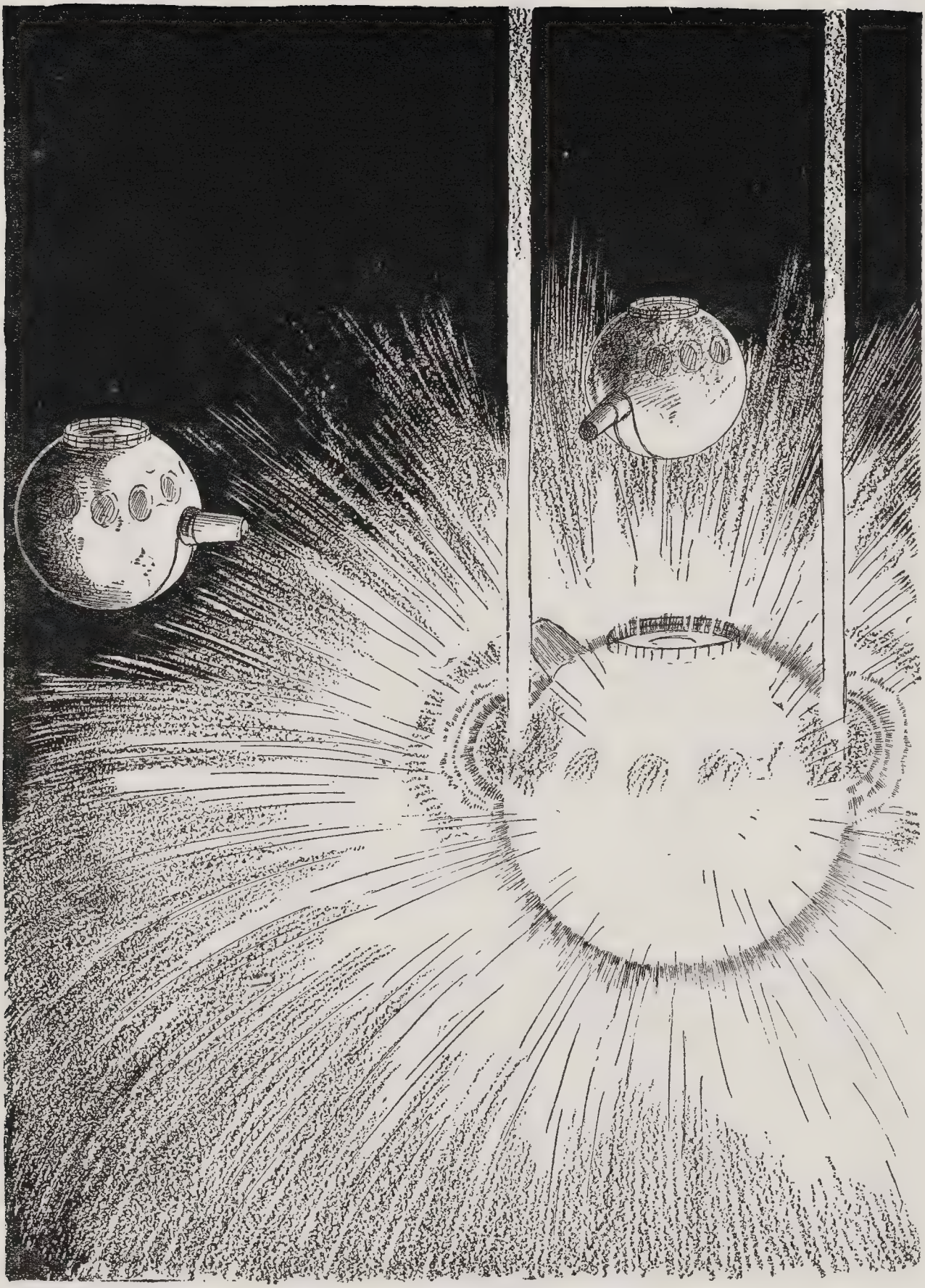
Cheers shook the Pioneer anew and its occupants behaved like so many school children, capering and slapping each other on the back in their glee.

But the professor proceeded immediately to the control room and set out after the other two spheres. One by one these were done away with in the manner of the first and it was a triumphant party that returned to the landing stage of the Research building. They had been away but thirty minutes.

XI

THAT night there was great rejoicing in Washington and in every city on the face of the earth. The General News Bureau kept the videophone going all night and, as news of the destruction of the three ships and of the rapid formation of defense plans was spread to the wilderness by fast aeros, the panic-stricken refugees gradually took heart and started a straggling return to their own homes. Shamefacedly they entered the cities, tired, dirty and bedraggled. Stealthily they left the public ways and hid themselves in their own quarters.

The professor organized the forces of the Department of Research. All night long he and his helpers



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labored to have complete plans tor the defense of the world put into effect before daybreak. The Thomas Energy people collaborated to the utmost and by four A. M. reports began coming in from all over the world announcing the completion of the tandem beam transmitters. It was very fortunate that standard apparatus could be utilized; that every single city had the resources and spare equipment of the Thomas Energy Company to draw from. When the first pink of dawn colored the sky every last city had reported the completion of at least one of the defensive weapons and most of the largest cities had prepared as many as ten. An improvement over the apparatus so hastily put together on the Pioneer had been devised by the professor and this, by his instruction, was incorporated in all of those constructed on land and in the aeros that were being fitted out. The two separate beam transmitters were now coupled together so as to produce parallel rays four hundred and seventy-five feet apart, to exactly embrace one of the enemy ships and to permit of one-man directing. A telescopic sight was installed central to the two beams and this was provided with cross hairs to be centered on the spheres when in the field of vision. All of the high frequency generators were set to produce exactly the proper frequency as determined in the initial experiment.

No sooner had the sun showed its glowing rim above the horizon than a radiogram was received from the enemy. It was evident from this that the rest of the fleet had no knowledge of the loss of the three vessels over Washington, also that the leader and instigator of the expedition was still in command. The message read:

"This is the great day. Our next blow is to be directed at your City of New York. Remember Munan. Mador."

In rapid succession came other messages advising the cities of Buffalo, Kansas City, New Orleans, and Montreal to prepare for their doom. No foreign cities were mentioned, so it was presumed that the enemy intended to destroy North America first before proceeding elsewhere.

"Now that we are prepared," said the professor in a weary voice, as he arose stiff-kneed from the table where he had worked for eight long hours, "we had better set out in the Pioneer to sort of supervise the defense and give aid wherever it might be required. First we shall go to New York and see what can be done there."

"That is a good idea, Professor," said Secretary Miller. "We will keep in touch with you constantly by video and I will have any instructions carried out that you might deem necessary."

Roy, Walter, and a picked force of the Research men left at once in the professor's ship with him and a very speedy trip was made to New York. They traveled at a high altitude—about twenty thousand feet—and in less than thirty minutes were over Manhattan Island. Far beneath them was a group of three of the enemy ships and they were approaching close formation preparatory to starting the atomic storm. Since the conducting beams could not be seen in daylight, the occupants of the Pioneer did not know whether or not any were being trained on the spheres from the city below. To make certain, the professor started his own beam projectors and high frequency generator. With the Pioneer left hovering he directed the twin beams on one of the cluster of three globes, just as the sputtering of the starting arc became visible. As the frequency indicator reached the mark made on its scale the preceding night, two of the spheres exploded simultaneously. The city defenders had been successful also!

THOSE of you who witnessed the destruction of any of these monster ships from Venus will never forget the terrific force with which they were blown to atoms by the high frequency currents set up from above or below. The violence of these explosions was so great that seldom was even the tiniest fragment of vessel or occupant found. This was another piece of good luck, since great harm must have resulted had any portions of considerable size remained to be hurled to the earth.

In this case the explosion of the first two actually blasted the third into the ocean. It landed just outside Sandy Hook with such a splash that the resulting waves swamped a number of seashore resorts along the coast. Manhattan was momentarily obscured from view of the Pioneer by swirling clouds of minute fragments which were all that remained of the destroyed vessels. Dwellers in the city afterward reported that the shock below was so great, though the explosion occurred a mile overhead, that pictures were thrown from the walls and glassware broken on the tables.

"That third one must not escape!" shouted the professor, as he dashed into the control room and headed in the direction in which it had been thrown.

In a few minutes he had reached the great globe, now bobbing about on the surface of the ocean, a few miles off shore near Seabright. A giant rubber ball it seemed to be, bounced about by the hands of unseen Brobdingnagian bathers. But, for all its destructive nature, it was a beautiful thing to behold and the watchers exclaimed in admiration as it rose from its watery berth with the multi-colored, polished surface reflecting the light of the morning sun in blinding magnificence.

It was almost with sadness that the professor directed the rays and pulled the switch which sent the high frequency current on its message of death and destruction. The great sphere was hardly five hundred feet in the air when it exploded as had its predecessors. The resulting concussion laid bare the bottom of the ocean for a space of several times the diameter of the sphere, and it seemed to the observers that the piled-up waters held their position for enough time to swallow up the powdered remnants of the destroyed ship. Then they rushed together with a crash that was heard for miles and the resulting turbulence produced a waterspout which continued for fully ten minutes.

The videophone was speaking and while the professor swung the nose of his ship toward Long Island the crew was advised from Washington of the successful repulse of the enemy at Buffalo and Kansas City with

the loss of six more of the enemy craft. That made twelve so far—and one captured!

Another of the atomic-storm-producing arcs had just been started over the western end of Long Island when the Pioneer arrived. But it had not much more than started when one of the enemy ships was blown to bits by impulses from below. The other two were carried about a mile in different directions by the force of the explosion and the Pioneer headed after one of these just as a huge air liner rose from the shore of Brooklyn in pursuit of the other. These two put on speed and started for parts unknown. But, with their speed retarded by the density of the earth's atmosphere, there was no escaping. A few seconds and all was over with them. That made sixteen!

The crew of the Pioneer was jubilant and the reports coming in from Washington made them even more so. New Orleans saved—Montreal—Detroit—Los Angeles—Tampico. Fifteen more of the enemy vessels accounted for! Now there remained but seventy-eight, and the morning not half gone!

BUT suddenly came a cry for help. The Pioneer was twenty thousand feet up and not an enemy ship was in sight when the Secretary's voice excitedly called:

"Professor! Something has gone wrong with the defense at Scranton and they report three of the enemy craft approaching. Can you get there in time?"

"I hope so. We'll try," answered the professor as he returned to the controls, swinging his ship around and heading westward with maximum acceleration. In five minutes they were within sight of the city and could make out the three spherical shapes in close formation as if about to start their work of destruction.

"Walter," called the professor, "Do you think you can get one of them on the fly?"

"I'll try, sir," replied Walter. He rushed to the telescopic sight and grasped the controls, rapidly swinging it around to the proper direction. With his eye glued to the eyepiece he called to his father:

"Give her the juice, Dad!"

Roy pulled the switch. The boy's aim had been accurate, for a cloud of bursting particles obscured the vision of the distant spheres. At least one of them had been accounted for!

Walter was so impatient he could hardly wait until the Pioneer was directly overhead. Then, without further instruction from the professor, he trained the deadly beams on first one and then the other of the fleeing survivors. Three more! And Walter had accounted for these three himself. He felt like a conqueror of old as he arose, shaking, from his position at the sighting control. Thirty-four gone!

"Fine work, my boy," the professor complimented him, "I was afraid we would be too late here. But you saved the city all right."

Walter was no more elated than was Roy, who secretly gloated over this achievement of his boy. He was morally certain that he could not have accomplished this thing himself at the speed at which the Pioneer was traveling at the time. A great boy! he thought.

Hour by hour the reports continued from cities all over North America of attacks by the invaders and the destruction of the great globes. Radiograms continued to come in from Mador and from the tone of these it was quite evident he was puzzled, though it was also apparent that he had not the slightest idea of how unsuccessful the attacks of his fleet had been and of the number of his ships destroyed. Evidently these were so completely taken by surprise and so quickly did they meet their fate that they had no time to apprise Mador of what was going on. But he was becoming suspicious on account of the lack of reports and, at five P. M., announced in a message that he was going to tour the North American continent and speed up the work of destruction. By the time this message was received it was calculated from reports received at Washington that eighty-one of the enemy craft had been accounted for. This, with the ship captured, left only twenty-seven with which to cope.

What a surprise Mador was to receive when he made the rounds!

For an hour or so no further news was received other than reports from a few cities that the enemy ships hovering in their locality had withdrawn and were no longer in view. As time went on it appeared that no further attacks were to be made that day, so the professor decided to return to Washington for the time being.

In the Research Building great excitement prevailed. The success of the battles against the enemy had keyed everyone up to a spirit of jubilation that was as intense as had been the previous despair. Reports showed that most of the cities had nearly resumed their normal activities, though there were still missing some of the people who had fled to the wilderness. Many of these would probably never return, since they were unequipped to cope with the dangers of the wild country they had so rashly entered.

No further messages came from Mador and it was beginning to be thought that the remaining twenty-seven of his ships had quitted the earth's atmosphere and started a retreat to their own planet. This theory had gained such credence by six-thirty P. M. that the news announcers were proclaiming it as an almost assured fact. Then it was suddenly upset by the announcement from the observatory of Washington that the remains of the fleet had been sighted about five hundred miles above the earth's surface. The astronomers had counted all twenty-seven of them huddled together as if in close conference. There was considerable of an uproar again when it was determined that the fleet was heading for the earth *en masse,* but this time it was in anticipation of the complete annihilation of the fleet which all citizens now felt confident would result.

The fleet came at a rapid pace and it soon appeared that they were intending to attack in the hope of overpowering the cities of the earth by sheer concentration of numbers. It was no doubt Mador's idea that the defenders had only a very few of the defensive weapons, since in all cases except one his ships had been destroyed one at a time. The course of the fleet was determined as being directed at the city of New York

and, as soon as this was assured, the professor again manned the Pioneer and started for his home city with the same crew as before. Advices to the defense committee in New York started them in full preparation for a decisive engagement with the entire body of the enemy.

XII

THE enemy fleet had been sighted by the time the Pioneer reached New York and the roof-tops of the city swarmed with millions of people who had assembled to witness the last great battle. The three New Yorkers aboard the Pioneer were greatly concerned at seeing this, since they feared their own loved ones might have joined the throng and would be subject to danger in case any three of the enemy vessels succeeded in producing one of the atomic storms while the defenders were engaged elsewhere. This fear was further increased when two hurried videophone calls made by Walter resulted in no answer, either at his own home or that of the professor.

But the enemy was coming and they had little time to consider the danger. Advice from the Bureau showed that there were now eleven of the beam transmitters set up at various points in Manhattan, Brooklyn, Bronx, Queens, and Staten Island. In addition, four huge air liners had been fitted out and were in their berths prepared for instant flight. The Thomas Energy people had provided special beam energy for each of these liners, the individual beams being so arranged that each could follow its own ship in any direction through any complicated maneuvers it might be required to make, and still furnish uninterrupted power.

The Pioneer, being invisible, was enabled to rise straight up through the enemy fleet and take its position about ten thousand feet above them.

Mador's plan of action was immediately apparent. He first dispatched nine of his ships, in groups of three, to the altitude of four thousand feet. One group centered over Manhattan, one over Brooklyn, and one over Bronx borough. No sooner was this accomplished than each group of three was backed up by three more at an altitude of five thousand feet. The idea was evidently to start two arcs at each point simultaneously, hoping to successfully produce an atomic storm with the upper group in case the lower group was broken up from below by the defenders. Mador did not reckon with the Pioneer! But the Pioneer would indeed be kept busy if it hoped to upset Mador's plan, since it could not possibly be in more than one location at a time.

"Walter," said the professor, "Your young eyes are quite evidently superior to my old ones in sighting our weapon. So I am going to appoint you our gunner for the rest of the fight."

"Thanks, Professor," said Walter, "I'll do my best." His heart pounded madly at thought of the responsibility which was to be his. But he did not flinch. He felt sure he could duplicate his previous success at Scranton.

"I shall maneuver the ship," continued the professor, "And you, Roy, will please man the high frequency switch and provide current to our little beams when Walter gives the word."

"Righto, Nils," responded Roy. He was nearly as enthusiastic as was his son.

At that moment the two arcs were simultaneously started by the six ships beneath them.

"Now Walter," said the professor, "Get one of the upper ones. We shall have to depend on the defenders of the city to get the lower ones."

"Right, sir," said Walter as he peered through the shining length of the telescopic sight, manipulating the two control wheels as he spoke.

"Shoot, Dad," he called breathlessly, as the cross hairs intersected the exact center of one of the spheres ten thousand feet below.

Roy closed the switch and all watched eagerly. Less than a half second intervened. Then the great ball with its sputtering electrode went crashing into infinitely small bits. At almost the same instant one of the lower ships went the same way—then a second one. The defenders below were on the job, too! Both arcs were broken before they were well started.

As rapidly as he could sight the beams, Walter shifted to the second of the upper spheres. It went the way of the first and immediately afterward the third of the lower ones exploded also.

WALTER was just about to train his sight on the last of the six when one of the Research men gave a startled exclamation:

"Look!" he shouted, "Staten Island is in trouble!"

It was true. Two groups of three globes each had gotten into action over the island. One of the lower ships had already been destroyed from below but the arc from the upper three was widening in scope as they retreated from each other. The survivors of the lower group were scurrying out of range of the down-sweeping arc. The flare of the rapidly spreading vortex hid from view of those on the ground the three ships producing it. But not so the Pioneer. Her crew had an unobstructed view of the three upper ships. There was no time to lose so the Pioneer was kept in its position and Walter trained his sight on the nearest of the distant spheres. By the time he shouted, "Shoot!" to Roy the storm had commenced below and a gaping hole appeared in the roof structure of the city where the tip of the funnel had contacted. This was exactly like a Kansas "twister," magnified in intensity a thousand times.

But once more Walter's eye was good and the atomic storm ceased as abruptly as it had begun. One of the ships producing it was gone. The second and third followed at once as the clearing of the air gave those below a clear view.

The Pioneer again turned its attention to the nearer boroughs of the city. Manhattan was clear of the invaders, but over Brooklyn there appeared a new formation of six ships, with the upper arc well started and the lower one just broken up by the destruction of one of the three ships producing it, which was accomplished from below as they watched. Walter had

already trained his sight on one of the upper ships when a shout came from the stern compartment:

"Look!" called one of the Research men from his look-out at that point, "The air liners have taken off!"

Sure enough, the four great ships had left their berths on the south shore of Long Island and were headed skyward at great speed. Each was a thousand feet long—their length more than twice the diameter of the enemy ships. But these ships, which normally carried three thousand passengers, were slender cylindrical affairs of great beauty, with blunt noses and long tapering tails.

They had observed the same thing as had been evident to those on the Pioneer—that the upper group of attackers was obscured from view below by the flaming arc produced by the lower group, however brief its duration. The four were heading toward a point above the attackers now over Brooklyn and three of them soon reached a strategic position for putting their beams into use. The fourth, however, came in a little too close to one of the ships of the upper group where the huge arc had started. Not realizing the tremendous power released by these machines, they did not fear the result of passing so closely. But the professor knew they were headed for disaster and he cried aloud in impotent warning.

Just then, when the liner was not a thousand feet from the nearest sphere, it seemed to halt in mid-air. Slowly it poised a moment, then like a plummet dropped sickeningly for the city far beneath. Swifter and swifter it fell until it plunged with a great crash into the roof structure of the city and disappeared in the midst of falling debris, leaving a great black canyon in the crowded upper surface of Brooklyn. The watchers in the Pioneer almost wept in the realization of the hundreds of lives lost at this point. But nothing could be done about it now. And the three remaining liners had already accounted for two of the upper enemy ships, thus breaking the arc and its threatening atomic storm.

Another group, this time of only three, was forming over Manhattan when the videophone spoke:

"Professor," came the voice of Secretary Miller, "Three of the enemy ships have withdrawn and are leaving. It is believed that one of them contains the leader, Mador. We must get them or they will return to Venus and organize another and more terrible expedition against us. Start for them immediately."

"Very well, Mr. Secretary," he replied, and at once searched the skies for the departing ships.

He soon sighted them and the Pioneer started upward at an angle so sharp and with such an acceleration that its occupants were mostly thrown to the floor. Fortunately the speed of the bulky enemy craft was not so great in the denseness of the lower atmosphere and the Pioneer rapidly drew near enough for the first shot. Walter held to the sight like a leech and was soon rewarded by the great spreading puff that told of the end of one of the machines. Still the speed of the remaining two increased and they were many miles above the earth when the second one was hit. The third was still more difficult and the professor was almost doubtful of success. They had traveled so far that the air was now extremely rare, and, when ionized by the twin beams, was a very poor conductor of the high frequency current. But just when Walter likewise had about given up hope—for the beams had been trained on their mark for a full minute—success came. With this one, though, there was not the violent explosion that had marked the destruction of its fellows. It was more of a fusing action, the great sphere slowly changing shape and commencing to melt and drip like a lighted candle. Leisurely the hull dissolved and fell away in huge, bubbling streamers. The interior was exposed to view and the crew could be seen rushing about in despair and gasping for breath in the thin air as the ship took fire and lost headway. Soon the great, smouldering, teetering cage tilted sharply and started its earthward descent.

THE Pioneer was close enough for all on board to see the figure of a man on the remnants of the control platform shaking his fists at the earth in a violent gesture of futile rage.

"That's Mador, as sure as you're a foot high," said the professor, "And watch him. He's going to jump."

Jump he did, with a last despairing, strangling gesture. The war was over!

"Great Scott!" groaned Roy, with sudden realization of the possibilities, "They'll fall in the city and kill many more of our people."

"I think not," the professor reassured him, "For it seems to me that we have progressed in an eastward direction and should now be well out over the Atlantic. But we'll follow them and see."

The Pioneer dropped in the wake of the wrecked ship, which, having reached denser air, was now flaming violently. They arrived at a safe altitude just in time to see the remaining twisted mass of structural metal work and machinery vanish in the depths of the ocean with a cloud of steam and boiling water marking the spot. Sighs of relief were breathed as they headed for New York.

When they arrived over the city everything was quiet and the roof tops were deserted except for groups of workmen who were clearing up the debris around the great gaps in the upper surfaces of Staten Island and Brooklyn.

"Now to see that our folks are safe," said the professor. He headed the Pioneer for his own laboratory and she was soon cradled in her own berth. "Sorry to leave you fellows to your own resources," he apologized to the Research men, "But we simply must find out how things are at our homes. And you can take the next air liner to Washington, so you will not lose much time getting back."

The men assured him that this arrangement was entirely to their satisfaction and, knowing his anxiety and that of his companions, did not delay them farther with the congratulations and praise they wished to bestow. The group parted company at the northbound moving way.

XIII

WHEN the three adventurers burst into Roy's apartment they found three solemn-faced women sitting before the videophone. But, on seeing them, the three women rose as one and, with cries of joy, rushed to the arms of their men. It was a joyous sextet that evening and tears gave way to laughter and merriment. The happiness of the parents was no greater than that of the two younger members of the party. And then and there consent was given and arrangements made for the marriage of Walter and Dorothy.

Secretary Miller called the professor to the videophone and advised him that the President wished him to appear in Washington on the following day with his two companions. He hinted at a reward for their services, but the professor laughingly protested and asked only to be left alone with his family and friends until the next day. This was agreed to with good natured banter on the part of the Secretary, and the professor returned to the rest of the group.

The women's description of the battle as seen from the city roofs was exceedingly interesting to the men, who had viewed it only from above. The concussions had been so terrific when experienced from below that many of the thick skylights over the upper ways were broken by the numerous shocks. The three air liners destroyed five of the enemy craft altogether and returned safely to their berths. But where the fourth had fallen, its machinery paralyzed by the power radiated from the enemy ship it had neared, great damage was done. The apartments of fully five hundred families were destroyed in its crash down through the city structure and the lives of six hundred citizens in addition to those of its own crew of one hundred and fifty had been snuffed out. On Staten Island nearly eight hundred had lost their lives during the brief time in which that portion of the city was subjected to the atomic storm. And the destruction of property in those few seconds was widespread, an area over a thousand feet in diameter having been torn down through fully fifteen of the upper levels of the city. Six levels of moving ways had been entirely paralyzed and were still not in operation.

After but little more than an hour's conversation the men became so wearied that they could scarcely remain awake. The reaction had set in and it was agreed that they must obtain sleep and plenty of it. Small wonder there was too, for the three had slept only in brief snatches during the preceding five days. So the party broke up at an early hour, the professor taking Zora and Dorothy with him to their own apartment.

Next day the professor was advised by Secretary Miller that the President expected him at the capitol at three P. M. with his two companions and their families. The professor notified Roy and the six met at the Washington Air Line terminal at one o'clock. There they were escorted with considerable ceremony and celebration to the great beam-lane ship that was to rush them to the world capitol.

At two forty-five they disembarked in Washington and were immediately ushered into the presence of the Terrestrial President in his own private office. He personally thanked the men for their work and told them of the meeting that was called for three o'clock in the assembly hall of the Capitol building. They left for this meeting, not knowing what to expect, and were completely astonished when the President led them out to the center of the platform facing an audience of fully fifty thousand people.

Upon their entrance the audience jumped to its feet and the auditorium resounded to the din of the clapping, cheering, and whistling. All about them on the stage were the high officials of the Terrestrial Government, including the Secretaries of all Departments and the Vice-Presidents of the European, Asian, African, and South American Divisions. It was a great reception and it was with much confusion for them and with many more cheers from the crowd that the visitors were led to their seats.

WHEN order was restored, the President stepped to the speaker's desk before the General News Bureau videophone and addressed the two audiences, those present in the auditorium and the vastly greater audience watching and listening to the proceedings in private and public videos all over the world:

"People of the world," he began. "We have assembled today to give honor and thanks to Professor Nilsson and his able assistants, Roy and Walter Hamilton, for their work in saving our civilization from untold disaster—possibly from complete destruction. It is just twenty years since the professor and Roy Hamilton saved the world from the equally serious menace of the inhabitants of Munan. They were not sufficiently recognized or honored at that time, but it is our intention to make up for it now as well as is possible. I will ask the three heroes of the War of the Planets to step to the desk so that you can all view them at close range."

Roy, Walter, and the professor approached the President in great embarrassment, standing beside the large disc of the videophone and directly facing the visible audience. Again the hall rang with the plaudits of those within. The professor fidgeted and fussed. Roy and Walter appeared nervous and ill at ease. But Dorothy hugged her mother and Thelda in her glee.

"Now, ladies and gentlemen," the President continued, "I shall get down to cases. Kardos, the commander of the captured enemy ship, has finally been induced to talk. He has told us many things and from his revelations it is certain that further warlike moves against us are planned by the people of Venus. His story of the machinations and plottings of Mador and the Munanese he brought with him to Venus would make your blood curdle. Further than this Kardos assures us that Mars is inhabited by intelligent creatures and that they are also in league with the people of Venus and are planning an expedition of conquest to our fair planet.

"For nearly five centuries there has been no war on our earth. Therefore no Department of War has been necessary in our unified government. But we have today organized a new Department of Defense—a de-

partment to investigate conditions on the two planets named and to prepare our world for defending itself against any attacks which might be made by them. I hereby appoint Professor Nilsson as Secretary of Terrestrial Defense."

The professor gazed in open-mouthed wonder, while the crowd again went wild with joy.

"Do you accept, Professor?" asked the President.

"Why—I guess so—and thank you for the unexpected honor," he stammered.

Zora beamed with pride and Dorothy could scarcely be kept to her seat, so great was her enthusiasm and anticipation.

"Next we come to that brave lad, Walter Hamilton," continued the President, "He it was who thought of the old book wherein he had read of the ancient experiments with material similar to that of which the hulls of the enemy vessels were composed. He it was who obtained this information for the professor, thus making possible the development of the apparatus with which those vessels were destroyed. I hereby present Walter with the highest honor which our Terrestrial Government can bestow upon a private citizen, the Medal of Distinguished Accomplishment."

Once more the hall rang with applause as Walter, flushing to the roots of his hair, stood close while the President pinned to the breast of his coat the coveted decoration. Needless to say, Dorothy was starry-eyed in her joy at this presentation.

"Thank you, Mr. President," said Walter, suddenly finding that his hands had grown unaccountably large and very much in the way. Thrusting them into his pockets, he grinned and shifted from one foot to the other.

"And last, but by no means least," said the President, "we come to Roy Hamilton, Walter's father. It was he who was called to Munan a score of years ago by the golden voice of the woman who is now his helpmate and the mother of his son, whom we have just honored. His work with Professor—I should say, Secretary—Nilsson at that time, as in the present case of the War of the Planets showed great courage and the spirit of the soldier. I hereby present him also with the D. A. medal and, in addition, commission him to supervise the art work to be carried out in the building which is to be erected in Washington in memory of those who lost their lives in this, the first interplanetarian war."

A New Scientifiction Story

The Vanguard of Venus

by Landell Bartlett

This story will not be published in any magazine but we have arranged to give it to our readers in attractive book form—ABSOLUTELY FREE. Turn to page 947 and learn all about this big Free offer. Remember! This is the only way that you will ever be able to read this remarkable tale.

It was Roy's turn to be surprised and he stammered and flushed even more than had Walter. The commission was a big one and would make him independent for life in addition to increasing his prestige greatly.

"Thank you sir," he said simply.

The President again spoke: "To conclude this ceremony I wish to extend the sincere gratitude of our entire world to these three. As to Secretary Nilsson—his discretionary powers in the administration of the new Department are to be absolute and he has the entire resources of the Department of Scientific Research at his disposal, as well as the captured enemy ship. I do not wish to make any definite recommendations as to the personnel of his Department, but I feel that it will be greatly to his advantage if he retains Walter Hamilton as his personal assistant in the great work he is to carry out. No doubt he will also find Roy Hamilton as loyal an ally and supporter in his new work as he has in the past."

The professor nodded vigorously. "You have taken the words out of my mouth, Mr. President," he said, "I had intended to ask your advice on the very point. My two dear friends shall always be with me."

He grasped the hands of both as pandemonium broke loose in the hall.

Dorothy's pride was manifest to everyone on the platform and when Walter returned to his seat her enthusiastic hugging and kissing of the much flustered youth sent all those dignified officials into raptures of delight.

When, a little later, the meeting broke up with wild demonstrations, Roy and the professor, with Thelda and Zora at their sides, stood in the wings, watching. Walter and Dorothy, all unmindful of the great men crowding about them, stood hand in hand, talking earnestly of the future. Pride in these two filled the hearts of the parents as they too spoke of the future and what it might hold in store for them all.

THE END

The World of the Giant Ants

By A. HYATT VERRILL

STORIES about ants are no longer a novelty in fiction. Scientifiction stories about ants have been written before.

But we unhesitatingly state that this new story, by the well-known writer, is no doubt the greatest ant story that has ever been conceived.

The editor of this magazine, in a talk with Mr. Verrill, who is not only an author of note, but a noted explorer as well, asked him to do a special ant story for this magazine. It is interesting to note, that practically the entire story was written in the South American jungle, during Mr. Verrill's latest expedition.

Readers will remember that Mr. Verrill discovered a new race of bearded Indians near the Peruvian wilds in South America. Outside of this, Mr. Verrill has for many years been making a deep study of ants and their habits, and the things that he tells us of them in this story are not at all exaggerated. If you magnify the usual ant, you will have exactly what Mr. Verrill gives us in this notable document.

We wish to impress upon the reader, the important fact that the habits of the ants as described in this story are scientifically accurate, in practically all respects.

Few people are interested enough to study a dry scientific work of ant-life, but here we are given the greatest scientifiction story of ants and the way they live, made particularly interesting because it is in fiction form.

In order to enhance the value of the story, the editor has taken the liberty to bring in a number of illustrations taken from well-known scientific works.

This story is published in the Fall Edition of

AMAZING STORIES QUARTERLY

Now on sale at all newsstands

Stenographer's Hands

By DAVID H. KELLER, M.D.

HERE is a story that no doubt will arouse a good deal of controversy. It probably will be denounced in many quarters, while in others it will be praised to the skies.

We live in a machine age. Only efficiency and accomplishment is of any importance in our present scheme of life. Everything works along the stencil line nowadays. We wear the same clothes, of which several thousand are cut with the same die; we wear the same sort of shoes, all made by the same machines and all alike, including the polish; we eat the same sort of food, coming out of the same cans, by the million; we read the same kind of literature, printed by the thousand and the hundred-thousand.

The stamp of the machine is upon our bodies and upon our minds. We all act alike, and come pretty near thinking alike. It seems to be quite the thing for all of us to be as exactly alike as we possibly can be. If we vary this formula, ever so little, we become conspicuous at once, which is not always to our liking.

And when it comes to the great industrial interests, the big employers naturally expect to have efficiency, which apparently they can only get by having their workers all perform along certain mechanical lines. All must work alike in certain endeavors and all must perform alike if results are to be had.

What is the logical end? Read Dr. Keller's most absorbing story. It will open your eyes. It will probably thrill you, or perhaps you will wax hot with indignation—all depending upon your temperament.

At any rate, this is one of Dr. Keller's best efforts so far.

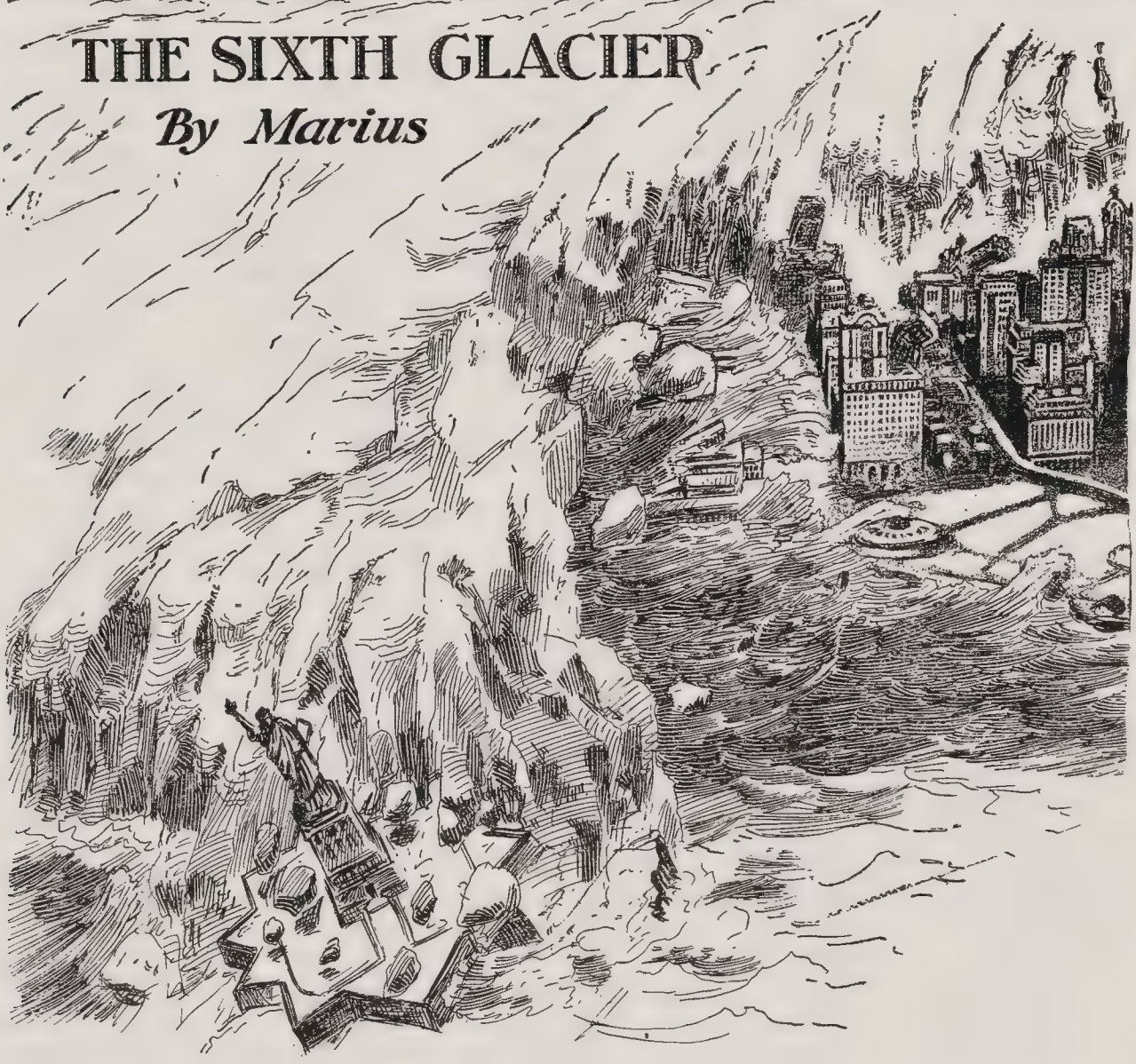
This story is published in the Fall Edition of

AMAZING STORIES QUARTERLY

Now on sale at all newsstands

THE SIXTH GLACIER

By Marius



Author of: "Vandals from the Moon."

NOT since "The Second Deluge" has there been a story that can be compared at all with "The Sixth Glacier."

Geologists tell us that the earth has been visited by five glacial periods in the dim past, running back over an actual period of millions of years. Why these glaciers appeared periodically and devastated the earth is not well known. It is certain, that if there were glacier periods, there will be more glacier periods in the future.

In any event, the author is using this theme for the basis of a most extraordinary story. We confess we have never read the like of it before. And for imagination, sound scientific reasoning and the inclusion of important detail, Marius certainly deserves high credit. In addition to all of this, the story makes excellent reading. It certainly is one of the outstanding stories of the year.

CHAPTER I

I Interview a Man With a Hobby

THE *Scientific News* was a semi-technical monthly which catered to the scientifically minded laymen as much as it did to the scientists to whom mechanics, chemistry, or astronomy meant bread and board. Old Hillsboro had founded the paper nearly a quarter of a century ago when scientific periodicals were rarer than they are now and laymen, who had a predilection for the perusal of such a periodical were rarer yet. His youngest son, the family's pride, had been my roommate at Princeton during our student days, and the friendship that later developed between his father and me, put me on the staff of the *Scientific News*.

Bulger, Bernard Ilmore Bulger was his whole name, was the editor-in-chief. A dried-up and garrulous little old man with an abnormally large head, a veteran of the editorial desk and one to whom the very air that he breathed meant no more than did the black and white pages of the *Scientific News*. To the little that he ever deigned to write, for he delved in sci-

But the glacier heeded nothing. It merely moved on, bayward, a jagged field of ice. It brushed the tall Statue of Liberty to one side . . . hurling huge cakes of ice high into the air . . . It tore the long bridges from their stony foundations and then crushed them to pieces underneath its icy feet.

ence but feebly, he signed himself as Bib. Yesterday I stood face to face with him in the untidy, paper-littered inner recess of his sanctum. He glanced up at me from beneath his green eye-shade, as he slowly chewed the wet stub of an unlit cigar, his blue Nordic eyes twinkling merrily behind the powerful glasses of his spectacles.

"You here at last, eh?" he said rather a bit curtly, I thought. His voice was dry and raspy, the words snapping out of his mouth in a staccato-fashion, like the bullets out of a machine-gun. Then, without allowing me time for a reply, he continued, "Care to see Dunraven, eh? You know Dunraven?"

"I—which—who—Dunraven?" I began a bit uncertain and hesitating.

"Oh, come, come," snapped the little man, a bit irritated. "Dunraven the old street-car magnate. Stephen Reynard Dunraven who lives in the big white house on West Eighty-third Street. You know the place well, or at least you ought to know it, you've been chasing up and down there ever since last Christmas. Take a run up there now, eh?" He stopped short.

"WHAT am I to see this Mr. Dunraven, street-car magnate, about?" I asked, taking advantage of the pause in his Niagara of words.

"About a hobby which he's got."

"A hobby. I see."

"Yes, he's nuts over some kind of a science study—Polontogy, or something. I know very little of such stuff. Out of my line entirely. I'm electricity, you know, pure and simple. Was raised on it. Suckled on the love of volts and amperes with my mother's milk. Pa was one of Bell's first disciples and I drink current out of a storage battery, so to speak."

"Paleontology, the science of the long ago," I interrupted him. "I see. So I am to interview him on paleontology. But what is this hobby of his that you speak of?"

"That's it. Paleontology, as you call it. That's his hobby. That and keeping mum. Heavens, but that man, when he wants to get way back into his shell, has all the qualities of an oyster. But you run along now and interview him. You know a thing or two about this paleontology. At least young Hillsboro used to take it quite to heart at college—bones and fossils and such things, and you roomed with him. Something of it, ought to have stuck to you. So run along now and try to get a write-up for the next issue. You had better hurry."

His desk-chair tilted forward to its natural position with a squeak and his huge head fell down.

"One moment please. What's old Dunraven and his hobby been doing? Anything out of the way?

"Oh yes." The eyes twinkled and his walnut-face peered up at me once more, and again the big chair

squeaked a protest as he leaned backwards. "He's been running about the country for a year or so now making lots of noise about a change in weather that is soon to come. A—"

"It is kind of warm for spring."

"Warm? No, no. Good heavens, man, no. Not warm. Cold. Cold is what he wants, and lots of it, and don't you forget that when you're on West Eighty-third street. Much cold. A coming glacier that is even now on its way, ready to freeze up the world. A new ice age, the pre-historic glacial period of the post-Pliocene of a hundred-thousand years ago all over again. Snow and ice to be as far south as Arizona. Sleigh-riding on Palm Beach."

He gave vent to a hen-cackle of a laugh at this bit of witticism. His face became redder. Then once again a wrinkled countenance and a pair of boyish eyes were confronting me.

"You see, he's been out paleontology-izing somewhere in north Mexico where he ran across some old Indian ruins, Aztec or something—very old. Well, he got together a Greaser pick-and-shovel crew and started digging. Pretty soon they unearthed a city, a very ancient city, mostly dust. It proved to be the abode of a hitherto unheard of civilization that flourished in its prime, about the time when you and I were jumping about on the tree-tops and cracking each others' skulls whenever the fight was on. A nation lived there when the Neanderthal man ran wild all over Europe. To make a long story short, he claims that he found a moulded and time-defaced tablet of gold in the ruins of one of the ancient buildings, and after a crowd of Egyptologists and experts on hieroglyphic picture-writing got through with it, up pops the old fellow with a warning of another ice-age soon to come, just like the one the world had a thousand centuries ago. New York, London, Paris, Tokio, all of them are to be crushed and buried underneath a mile of ice. Pretty good story, eh? He wrote to practically every scientific and pseudo-scientific paper in this country and in England. He wrote to many papers that are not scientific. These rich men with hobbies never stop at anything. And he became much peeved because no one paid any attention to him. Regular sore-head. Earle of the *Science-Union,* a weekly, was one of the few who took him up. He wrote Dunraven, asking for a brief statement of facts. Earle himself told me that Dunraven's reply required quires of paper to print. It was at least fifty-thousand words long. He condensed it into four columns of print and let his readers have it, together with the old man's picture, whereupon Dunraven wrote him again—a long letter—telling him just what kind of an editorial ass he was. Then he shut up shop altogether and refused to talk paleontology to anyone. He's still sore. Pretty vain, eh?"

"And I am to interview him about—"

"About this discovery of his, the coming ice-age, the sixth one. We've had five already, and now, so says Dunraven, a new glacier is due. And who can tell but that the old bird may be right? But be careful. The old fellow, so I hear, is down with the gout and not very cheerful, and his temper was never of the best. But you're big enough to look out for yourself, though I hardly believe he would be violent. At least while he is suffering from the gout. You ought to be able to handle him all right. You've been running around with his daughter ever since her dress caught fire at that poor children's fund Christmas tree party last year, when you played hero. Well, none of the other boys are any too anxious. At any rate get a line on it by hook or crook. May be more to it than we suspect and it pays to be first. Anything is legitimate in this game, you know. We're the one's responsible. Now git."

STEPHEN REYNARD DUNRAVEN, practically sole owner of the Seaboard Rapid Transit, had never played true to the rich man hero of fiction. He had not come over in the steerage, a poor immigrant boy, had never been a bare-footed country lad, nor a ragged city street Arab nor had he worked himself to riches and fame by his own efforts and ability. On the contrary, he was the pampered only son of wealthy Sir Cecil Dunraven, an English nobleman, who came, saw, and conquered on this side of the Atlantic. His youth, just as his early manhood, was spent with the complete abandon of those to whom time and expense are nothing. When his father, the old British peer, died, he left all of his worldly goods to his only heir and so, though nominally only, Stephen Reynard became the guiding hand of an entire traction trust. In reality, however, the gaylights claimed him as their own, and though later years had tended to sober him down, he still retained much of the colorful attire and the love of the adventurous, that marks the gay-blade. Then, when an unrelenting nature began to insist upon tolls long overdue and gout and asthma laid heavy hands upon him, he ceased to offer further worship at the gay altar of Bacchus and the energy which once upon a time had been expanded on Broadway, in Deauville, and at Monte Carlo was now given vent more sedately in the realms of science. In the clay with which he was moulded had been mixed a quantity of that stuff which the world knows as stick-to-it-iveness. He had the virtue, the blind virtue, of perseverance, the bulldog's grit for hanging on. Just as pleasures had claimed him in his youth with a force which an outraged nature alone was able to tear asunder, so in later and more sober years, that which took the place of the gay, white lights held this never quiet man. Paleontology became such a hobby to him as photography is to the inveterate Kodak fiend or stamp-collecting to the incurable, rabid chaser after old postage stamps. And just as at one time he lived his life in an atmosphere filled with wine, music, and laughter, so now he dwelled in a primordial atmosphere of musty catacombs, dusty ruins, and ancient cities, the inhabitants of which had long ago become one with the elements from which they had sprung, a fanatical worshipper at the altar of dry mummies, resurrected dinosaurs, and Piltdown skull alike.

AN immaculate and time-ravaged butler, a heritage of the Dunraven estate, ushered me into the

presence of the prematurely aged traction-magnate. He was in his study—sunk deep in the soft depths of a plush chair, one of his feet propped up on a stack of velvet cushions and a basketful of tiny, fragile bits of bones spread over on his lap.

'Lo, Bender," he grumbled, when he caught sight of me; then more softly, "Clara will be back soon. Come here and sit down next to me." His tone implied that he was not in the best of moods.

"Been having a messy lot of trouble lately with some of these periodicals that call themselves scientific," he opened the conversation abruptly, as was his habit.

"I see." I was preparing for an opening and had to be careful.

"Of course you've heard of my little 'find' in Mexico. An ancient ruin, very ancient, a city a thousand centuries old. A city that was old when man was still in the tree-tops and the caves. The dailies and a few of your scientific sheets gave it a write-up, but very little, indeed. Yet, Bender, the future of all civilization hangs on it as if by a thread. I'm not exaggerating a bit. All civilized life."

He paused meditatively enthralled in his bones. I broke into the silence.

"That is the very reason why I am here, Mr. Dunraven," I began in almost apologetic tone. "I am, as you know, connected with a periodical that—"

I stopped short, for he had started to snort like an angry bison.

"Uh-huh. Oh, yes. The *Scientific News,* a sheet that caters to those who want their science cut and dried, and made up in pill form, energyless ones who lack the spine to fight or the brain to reason out a thing for themselves. Make-believe Pasteurs, milksop Galileos, parrot Marconis. So they've given me a tumble at last, eh. Even send their hound-pups on my trail. Getting scared, or what? Too cold already? The ice is on its way, eh? Or maybe the prospects of a golden harvest to be reaped on the scientific back of old Steve Dunraven? No? Then can it really be that the glacier story has finally penetrated even a submediocre cranium and that this is the first yelp for help out of the scared pups? Out with it, young fellow. What's stirring in the editorial circle?"

His manner, though brusque, had the tone of the curious man behind it, and I felt somewhat reassured. Emboldened I opened my mouth as if to speak but he stopped me with a gesture. He was vain and to him this was the sweet nectar of revenge. I allowed him to proceed uninterrupted and was a silent listener to a half hour of declamations directed at the heads of a score of editors.

"Your own paper, the *Scientific News,* he wound up his tirade, glaring at me, "is the best of this sordid lot, but even so it falls short of the mark. Nets the tiny fish but lets the big ones go—the important ones which really count."

He had lost all of his former heat and fury which I feared would develop into apoplexy, and was now more of the lecturer or the teacher before the class. He rang a bell and almost instantly a noiseless Jap serving-man appeared, entering on feline feet. He took a brief order for refreshments with dark, immobile features, and then retired as silently as he had come.

"Ido," remarked the stout amateur of science, "an Oriental relic as silent and as expressionless as any Budelha statuette of his native East. Strange people these Orientals—at least, strange to us."

The Jap serving-man came and went again, cat-like, silent.

"Now," said the scientist, settling back on his soft seat and raising his glass, "I will tell you a story."

CHAPTER II

The Man With a Hobby Tells a Story

"ABOUT a year ago and despite my gout, which is bothering me now," continued the talker amid the clinking of chipped ice against fragile glass, "I decided to ramble to and fro in the sandy wastelands of Mexico in pursuit of my hobby. Mexico, abounding in remains historic, pre-historic, savage, semi-savage, and primordial, is a veritable Paradise for the archeologist and the paleontologist, as well as for the seeker after historical facts. It is a fertile and still only slightly explored field for every science, from Zoology to sociology. It had civilizations when Rome was young. Square mile after square mile even to-day lies unexplored between our border and that of Central America and no discovery above or beneath that soil would surprise me one whit."

"Near a little railroad town on the Sur Pacifico del Mejico, named Hermosillo, Dame Fortune so twisted the webs of my life that I had the luck to run into a young mining engineer who had just returned from an unfortunate gold-seeking venture along the Yaqui River. He had barely escaped with his life from that almost forbidden territory of America's most savage of redmen. His partner, an aged metallurgist and a man of scientific inclinations, had been killed by the Yaquis and among his scanty belongings, the youthful engineer and gold-hunter had found a crude map hastily drawn with pencil on a brown paper bag. Time and rough usage had acted to obliterate the map and as the young man was not possessed of much patience, the deciphering was a failure and so on the following day the unfortunate gold-hunter started back for his native England.

"By all means this should have been the natural end of my story, yet the twists of chance were such that the disappointed Englishman left his map behind him and on the following night, not having anything more useful at hand, curiosity, that virtue of virtues of the scientific mind, tempted me to ponder over the roughly sketched map on the Manila paper bag.

"It showed roughly the sketch of a hill or mound. A hillock such as are common among high mountains, was set at one end of it like a tiny nodule on a very round potato. A poorly sketched cabin with the almost obliterated words 'house' and 'ancient ruins' was indicated at the foot of this nodule. The rest of it was measurements and names, out of which I could make nothing. Upon a close scrutiny I managed to decipher the all but obliterated word 'Magdalena' and

an indicating arrow at the extreme right of the map. It was the key to the puzzle.

"OF course it is needless for me to tell you that I allowed very little time to pass ere I was at the scene so obscurely depicted on the map. A blood-hound of science must follow even the remotest of clues, and so one day later the little town of Magdalena became my home and headquarters. On the morning of the second day I went forth to investigate. The third day found me wild with excitement.

"The mound was there. The map had not lied nor was it the idle offspring of some over-imaginative mind in search of something to do, and my chase had not been empty. At one end of it, as indicated, was the mound and at the foot of this stood a ramshackle apology for a cabin. Years ago, probably, some gypsy peon had stopped long enough in his vagabondage to raise a crop of corn or beans there and had built this little abode for the shelter of himself and his family. Beside it appeared what at one time undoubtedly had been the entrance to a shaft or excavation. Upon examination this proved to be about ten or twelve feet deep and about five feet wide, and had all the appearances of a very old well which had gone unused for many years. I decided to investigate.

"With the help of a hired peon, I started to dig and we dug laboriously to a depth of about twenty feet into the soft bowels of the earth and then the bottom caved in beneath us, and we fell an extra ten feet. My half-breed helper was badly scared but this newest discovery only augmented my ardor. I decided to go deeper yet and, despite the pleas and warnings of Pancho, recommenced digging. I was rewarded amply, for after a very few strokes of my pick I struck rock, or rather brick. I cleared away some loose earth and you can imagine my surprise when I picked up the fragment of a time-hallowed wall. A minute later, with throbbing heart, I was contemplating a part of some very ancient structure made up of bricks of a dull red hue. I shouted a 'Eureka' which almost scared the wits out of Pancho who, armed with a shovel, retreated to one end of the gloomy pit as if expecting an immediate attack from a madman.

"The short twilight was now in the skies overhead, and so deciding to follow up this bizarre clue on the morrow, I made use of dangling rope, and together with Pancho, emerged to safety and mediocrity.

"The next day I returned to Magdalena for additional assistance.

"The tale that the post-Pliocene strata into which I had dug unfolded to me was one which no man had ever been told before. The record, ever so ancient, that Time as it passed had left behind it beneath the mound, to let the world know of its slow but sure predatory raids, was set before me awaiting only the translation which the geologist and the archeolgist alone can give. The entire story of the re-elevation of the continents and the restoration of milder climates that so marked the post-glacial years and brought on the advent of true man, was open before my eyes in this little excavation.

"WELL, I'll not go into any details of the excavation work itself. Suffice it to say that it was within the comparatively short period of three months that our picks, shovels, and bars had cleared away enough of Nature's ancient deposits to reveal to daylight a new long lost city, or rather a long lost civilization, a civilization which soon proved itself to have been hoary with years, at the period when the flat-skulled ape man was Nature's highest bid toward humanity. Now fat lizards warmed themselves on the hot sands that covered it. Further clearing revealed ruins of walls and caved-in cellars where the dust heaps of Time reigned supreme. Here and there remained a part of a tower or fragile wall, still erect, which gave mute testimony of bygone days of pomp and grandeur, and over it all, like some Time-ravaged sentinel, a tall, broad-based edifice, almost intact, raised its head. It was the brick balustrade on the top of this that my inquisitive pick had struck. Starting out as a pyramid and almost solid the tall tower went up heavenward to about one-fifth of its intended height only to become a slender, flat-roofed octagon-shaped steeple, which resembled a very tall lighthouse set on a pyramid rock, or a gigantic church tower overlooking the plains. The pyramid part of it was of solid masonry, roughly hewed stones placed one on top of the other in the manner of the tombs of old Egypt's kings. Its sole interior was a single passageway full of debris, about two feet wide and about five feet high. The tower was of small rust-colored bricks, and reinforced with crude iron girders as are the towers of the modern sky-scraper.

"It was to this mammoth tower and all of its indications toward scientific remunerations, that I henceforth gave all of my time and attention. With the aid of two savants, whom I had hurriedly summoned to the spot, and an extra large crew of intrinsically indolent peon day-laborers, we had cleared away, in two weeks, practically all of the debris that for so long a time had remained untouched. As dust, stone, and earth reluctantly left their ancient homes there was revealed to our astonished eyes the unmistakable outlined likenesses of galleries, laboratories, and classrooms. Even Time, through its slow and silent raids of countless years, was unable to obliterate entirely the traces and outlines that shelves, test-tubes, and books had left behind them as ghosts of a bygone glory. Even the unpracticed eye of the layman was able to see as much. Brown rags that semed to melt beneath the touch told mute tales of age-old volumes, tiny bits of vitreous matter of glass tubes and jars, and moulded metal told of bench and shelf.

"And now comes the pinnacle of my tale. Without it, in fact, there would have been no tale at all. Searching for further scientific data, I found the gold-plated tablet which warned of the glacier—the sixth glaciation period of the last ice-age, which is on us even to-day. It was set in stone, cracked, moulded stone,—rough-hewn granite. It was encrusted with such accumulation as a thousand centuries alone can give and required three whole days of slow and careful washing and scraping to bring forth to light the hieroglyphics that

told of the ice to come—the impending sixth glacier.

"HOW the world greeted my warning you know very well. Where it was not indifference, it ridiculed with base, cheap ridicule, in which I suspect that envy took no small part. Men were too busy chasing pennies, lying, stealing, killing, for them to pay any heed to a scientist, who shouted silly tales, of the north-pole coming down and crushing their fifty centuries of gatherings and accumulations beneath a mile thickness of ice and snow. I gave voice to my warnings of danger through that moulder of public opinion—the daily press, and through periodicals which claimed science as their fetish. Because I was 'old man' Steve Dunraven, ex-street-car magnate, political power, one time Broadway cut-up, and a very rich man with a queer scientific eccentricity, up popped the editorial ears for a while. Every daily had a column or two and every magazine printed my picture. But it was too much to ask for more. Lost in a maze of scandals politics and other juicy tit-bits of lasciviousness, an occasional word or two did appear in one sheet or the other, but not for very long, you may be sure. True, a scientifically inclined editor or two did take up my story, but, somehow or other, it seemed too harsh, too dreadful to ponder long upon. People hate to know of dangerous things, even when they are near. Some one invented a new type of non-refillable sodawater bottle and the spaces which should have belonged to the Sixth Glacier were given over to mediocrity and sodawater bottles, and a mediocre-minded reading public had gotten its demands. But what's the difference? They'll know soon enough that it's here when it arrives.

"Would you care to see the plate I found?"

I did care. In fact, I was eager to see it. A young and ambitious writer on the staff of an esteemed scientific publication, I hungered after something like this, a chance to show the stuff of which each and every one of us thinks that he or she is made of. Like a carnivore mad with appetite, I pounced upon this juicy meat handed out by Chance. What an opportunity! What a blow at those supercilious ones above me, my senior wise-acres. A multi-millionaire and trust-head, a by no means unworthy amateur of science, and a possible world-saviour taking me, poor little me, into his confidences.

CHAPTER III

Out of the Long Ago

BEARING with it the musty aura of an epoch of bygone eons, the plate, in size like the top of the average kitchen table, seemed to tell mute stories of civilizations now dim and distant in the oblivion of the past, of peoples now long ago dead, whose histories were in the mould when man was young. Time had dealt roughly with it as it does with all else. It had fringed its metal edges and through countless centuries had torn gaps in its surface. Yet Time plays freakish pranks and so much of the hieroglyphics were legible, that even I, an entire ignoramus as far as Egyptology was concerned, was able to discern that this plate would never be out of place among the many stone and metal echoes from the past which Egypt, and the entire Levant have given forth from cave, excavation and ruin. We grace our museums with them at the same time they allow the scientist to look behind the mistiest curtains of the past.

"Well," grumbled my host, assuming an indifferent, almost hostile air, which was belied by the satisfied look on his face.

"It's great, wonderful," I answered, and a moment later the door of the big room was swept open on almost noiseless hinges and Clara entered silently and nimbly, like a kitten. She broke a very awkward silence.

Clara was tall, of the Juno type, a bit too tall for a woman, I often thought. Yet such types did the sculptors of old love to let live on in marble form. She carried her weight gracefully, like a gigantic ocean-grayhound or a tall grenadier. Her features, a bit small, told of northland forebears, while her sky-blue eyes sang merry sagas of Arctic seas, on which rode the storms of the boreal lords. Then too, if one looked close enough, one could observe, behind that petulant, girlish mask, a bit of the bulldog and of the tiger that was her father. Clara was a Dunraven, no mistake about that.

During the meal that followed the girl's arrival, the rich amateur of science was still very voluble concerning his Mexican discovery. He told of the various scientific definitions of the causes of the five previous glacial periods; and the theory of polar earthquakes, great and fierce enough to elevate the northernmost and southernmost regions of this globe and send millions upon millions of tons of Arctic ice on a wicked errand to the temperate zones, was described by him. He told of the theory which has it that approximately once every twenty-one thousand years the coincidence of a northern hemispheric winter through the precession of the equinoxes, with an Ephelion of the earth and thus the greater distance and the longer wintry absence of our solar life-giver causing a longer, more rigid, and more rigorous winter, which of course was that much Greek to me—of the theory of interfering atmospheric agencies and a consequent shifting of the sea's cold water currents, and he finished with a theory or two of his own, to all of which I gave a politely attentive ear.

"But," he continued, laying down his napkin with a thud, "we were all wrong, every mother's son of us, scientists and all, and every theory is but so much nonsense. No earthquake, since this bit of an ore started to solidify, could be big enough, no winter harsh enough, and no shifting of a score of Gulf Streams effective enough to cause a world of ice and snow to leave its polar home and come down as glaciers toward the warmer climes. Bigger agencies must prevail—outside agencies. How about a frigid space in this endless cosmos, for instance? Imagine a huge frigid belt in interstellar space, this unbounded vastness that holds all, and through which frigid area our tenth rate sun with its escort of tiny balls must pass periodically, to freeze our water to solid ice, as we

rush hither and thither through eternity and orbit space.

"THE plate," he resumed after a huge draught of hot coffee, "was a puzzler from the start. The half-baked Egyptologists and hieroglyphic experts at my service could do but little with it, though credit is due them that they tried. Of course, some concessions must be made to the fact that it is not such a one as the average hieroglyphic expert is at all likely to encounter. Although it told its ancient story in direct form, just as those ancient historians of Babylon and Chaldea recorded their battles, sieges, hunts, and feasts on the stones, which once upon a time graced their palaces and now fill our museums, this story was such a one that no expert who had expended a lifetime in delving into the lives of Pharaohs or the wars of the ancient Cretans could be expected to comprehend it. Accustomed as they were to picture-writings, which depicted historical events, religious ceremonies, deaths, and such, what chance could they possibly have had with the representation of a ball or sphere surrounded entirely by a hazy, cloud-like aura, and covered all over with cone-shaped upheavals? Then there is also a series of very puzzling "chicken scratches" or markings on it. The experts had already given it up as a bad job, but it was just where they left off, baffled, that I began. Armed as I was with my knowledge of paleontology, which as you know is like a hobby to me, I could break my way into the puzzling strongholds of the crypt which their wisdom in the reading of historical pictures never allowed them to enter. I knew well that the tablet had to do with events that took place in its hey-day of a thousand centuries ago. The Egyptologist does not delve into the past for one-tenth of that time. He draws his conclusions from what, to the delver into the primordial, would seem but the modern world. The picture of an ice-covered world in the throes of a gigantic frigid epoch spent in frigid space, could not be solved by men, who could see no farther back into our past than ten centuries, the tail end of the Neolithic Time where the paleontologist generally leaves off. To them it was a mystery. A few even put it down to a primitive practical joke. I alone saw its worth and later its terrible meaning. Luckily the warning had come in time.

"One night as I pondered over the tablet which I had obtained out of the long ago, the thought of its great age came suddenly into my mind and would not allow itself to be dislodged. It was over a hundred-thousand years ago, the day of the flat-skulled Neanderthal man and the jaw-bone war-club, that it first saw light. I mused on this tusked and hirsute forebear of ours, who because of a nobler brain lived to propagate its race while the stronger ones died. Too slow to catch the contemporary animals smaller than himself, too weak to give combat to the bigger ones, he in his hyena-like existence was more often the hunted than the hunter. They were hard, tough days, those early days when our race was still in the crucible. To-day your neighbor was your friend, tomorrow he might be a hungry enemy. And then, I mused to myself, came the ice, the fifth glacier of the last ice-age. In an instant I was out of my reverie. The key to the puzzle had been found. The ball was our own globe, this tenth rate handful of dirt which we call our own. Fool that I had been not to notice that before, with its seven sister planets around it, its tiny satellite nearby, and the rays of the sun cutting into one corner of the picture and only to disperse and lose themselves, as though they were powerless, in the icy cloud which surrounded the rotund earth. One of my experts had even remarked it as being an astronomical or even an astrological study, but of no importance to science. The jagged protuberances were hills of ice, highly magnified so as to give them their worldly import, that left only the most torrid part of our globe out of the realms of the glaciers. There the hot sun of the equator proved a barrier to the cyclopean fields of ice which vise-like held the central strip of the earth in their chilly jaws. The cloudy aura around the globe could show only one thing—that we had run into a vast frigid nebula in space as our tiny solar caravel floated on this endless ocean of eternity. Another glaciation was close at hand and perhaps was even now upon us.

"NOW, as you have probably noticed already on the plate are five sets of horizontal crisscross figures, one beneath the other, just like so many "hen scratches" in barnyard sand, and in indicating arrow points from each one of these to the frozen globe. At first they puzzled me greatly. Six vertical lines, each one of them about four inches long and as straight as any arrow. Across the first five is drawn a number of horizontally placed cross lines one on the first, two on the second, three on the third, eight on the fourth, and five on the fifth. The last one is bereft of any crossings. After hours of pondering, during which time I became a grizzly bear to my household, I came upon the happy solution that this was the numerical system of those people who passed away centuries before we came and left behind them the warning of the ice. Each crossed vertical bar was to them what a numerical figure is to us. A blank bar meant zero, one cross a one, two crosses a two, and so on, each numerical unit in its proper place, units, tens, hundreds, thousands. The five numbers on the plate, one below the other, were the same, one, two, three, eight, five, zero, one-hundred and twenty-three thousand, eight-hundred and fifty. A long number of years; a long, long time. To pass through so vast a history, the space of the five periods of glaciation of the fifth ice-age, each one separated by more than a thousand centuries, almost one million years in all, their civilization must indeed have been a hoary one. Five glacial inroads with their relentless icy fury, came and went through the ages of their history, each one left destruction in its wake, and yet these people still lived on, lived on long enough to warn us of the sixth. Came the troglodyte, tusked and hairy, only to disappear in the darkness of the past, leaving behind him his handleless flints to show that he had been a being in this grand scheme of things. Yet these people continued to carry on their civilization. Where, or who their remnants are, who can say?"

He stopped abruptly and glared at me. I thought it high time for me to give voice to something. Fortunately a question occurred.

"How," I asked, "did you deduce that the necessary one hundred and twenty-three thousand odd years are gone by and the time for the sixth glacier is here?"

"Geology, my dear young fellow, told me as plainly as a calendar could have done, the approximate age of the buried ruins. The post-Pliocene strata had covered them entirely. That they were pre-historic, paleontologic, I was certain beyond a doubt. Skeletel remains, flat-headed, thick-boned, tusked skulls, long bones of ape-like arms and short, crooked legs, gave me so much mute testimony and corroborated my guesswork. I was viewing the remnants of a city which at the most conservative of estimates was well over a thousand centuries old. What business the ape man had there I am still at a loss to understand. The brains that were able to erect so grand a city were by no means enclosed in flat, thick-boned skulls. A nobler race, surely, once upon a time had lived, wrought, and died there. Geologically I was able to discern that this spectre of a city was of the early part of the post-Pliocene, in round numbers about a hundred thousand years ago. This much was certain for the story of the strata is a faultless diagram of the earth's early history. And that was the time of the last glacial era.

"Of course, it might not have been due for ten thousand years yet to come; but then again, I thought, it might be on its way even now, silently hurrying southward to destroy us. I did not care to disturb a satisfied world from its complacency with the tale of a probable ice age, perhaps ten thousand years hence. Such far off things would not interest most of us. Oh, if I could only be certain enough to bring it close to home.

"ONE day nearly half a year after I had first sunk pick into the sandy soil of Mexico and unearthed this warning, I happened to be talking with Professor Roane, the old man on Mt. Hamilton who has spent most of his lifetime at the eyepiece of a huge telescope. He has a few brochures and an astronomical treatise or two to his credit, and is an unquestioned authority on anything in the skies. During our conversation, he happened to remark in the most off-hand way possible, that a hazy nebula, almost invisible, had suddenly popped up in the direction of Orion. It appeared as if a very light mist had floated in front of his telescope, and like an ethereal pall it hung suspended in space about a billion miles away. As days went by it became larger and drew nearer. Next it was found that it was not traveling at all; that, on the contrary, it was fixed and rigid in space. Instead, our entire solar system, was moving toward it at many million miles a day on our grand journey through orbit space. 'Eureka,' I cried, for at last I had found my frigid belt in space, the cloud of coldness of the golden plate, the cloud that was to bring the ice and usher in a reign of Death. The hundred and twenty-three thousand eight hundred and fifty years were up, and the northern ice was free again and even now was on its way. The warning had not been found too late. There was still time for action.

"Well, for a time I foolishly nursed the asinine notion that a grateful world would be polite enough to give me at least a bit of attention. But, bah! Look at them now!"

I LEFT a half hour later. A newer world had opened up before me and in the dimness of it I saw the stout amateur paleontologist and multi-millionaire traction man and his pretty daughter. I gazed for a while at the sky. It was inky black, for the moon had not yet arisen, but the ebon monotony was broken in a hundred million places by so many tiny pin-pricks which scintillated like fairy magic lanterns in the void above me. No sign, no trace of the ice-cloud of the warning plate from the hoary past. Even the air of the night was too warm for springtime, yet I shivered instinctively for I knew only too well that the man had not talked without cause.

CHAPTER IV

The First Warning Cry

ONE day the news from Copenhagen came by the International News service, that the Arctic exploring auxilliary ship *Sven Hedin*, had sent a wireless to her home port, Copenhagen, the Danish capital, telling of immense ice floes in the vicinity of 83° N.L. Twenty-four hours later her commander, Captain Martin Jensen, wirelessed his home office that the *Sven Hedin* had been entirely locked in by a sudden freeze and an inexplicable rush of ice-floes from the north. He commented on the strangeness of such a situation at that season of the year, and reported that as far as he was able to observe, a rugged, peaked ice-field was the supreme monarch. An hour later he sent out his danger call which at the same time was his farewell. A terrific boreal snow-storm was even then in progress and rigorous Arctic winter was being ushered in in June. This was the last ever heard of Captain Jensen or the *Sven Hedin*.

It was only then that I realized at last that the glacier had really come. I looked out of my window and down on the street below. People were walking by unconcernedly; none of them seemed to be in a hurry. Some little children were playing a game on the sidewalk, two larger boys were catching ball in the center of the street, while a small group of bobbed haired school girls were coming merrily from school. No one appeared to heed the warning of the ice, yet the crack of doom was even now upon them. Could it, after all, really be so? I questioned myself, and then I thought of the little news item from Denmark and saw a mental picture of the ill-starred exploring ship crushed in the icy embraces of the boreal deluge, far off in the north. For a moment Nature's first law, that of self-preservation, gained the upper hand, and I had a vague notion of a tropical flight. Clara played a big part in it. A fleeting cinema display of a bamboo bungalow on some sandy shore beneath the blazing sun of the equator, and Stephen Dunraven's pretty daughter near-by, passed before my mental eyes, lingering but for a second. It

was instantly followed by that of a northern world locked in the cruel throes of snow and ice, ragged, cold mountains that seemed to press against the leaden sky, covering in its depths, that which at one time had been a civilization, and I shuddered involuntarily. With Clara (for some reason or other I could never get her out of my mental pictures) I was living in a snow igloo, hunting walrus and eating blubber. I wore a furry Eskimo tamiak and walked on wide unwieldy snow-shoes, racket-like frames filled with reindeer sinews. The telephone bell rang sharply, a very prosaic every day occurrence, far from dreams and reveries.

Stephen Dunraven was at the other end of the wire and his gruff voice invited me to come over immediately. He had something very important to tell me. He was witty a bit—something about a trip to Panama and having reserved seats on the boat before the rush. An hour later I was on West Eighty-third Street.

"I am in touch with the 'Land's End' of the world," he let me know even before I had entered the door of his den, "and have just received word from Spitzbergen, far away off northernmost Russia. A wireless to Leningrad has it that a huge drop in temperature has pervaded the entire northern part of the country and goes on to tell of immense ice floes in the seas around Spitzbergen and Franz-Josef Land. This was three days ago. No more news has come from there since. But things have progressed there rapidly. That land was the first one to go and is even now under a hundred feet of ice. The glacier is on its way.

He paused and drew himself erect, a silent way of saying, "I told you so."

HUDSON BAY was heard from next, as it too entered the cold fringes of the frigid belt, and in two days it was silent. I awaited the glacier with a feeling that was not unmixed with bodily fear. At last we had entered the area of the cold spot in space which had thinned out into invisibility when we approached it.

The *Scientific News* was the first to warn the world, and combined its cry of danger with an apology and appreciation for the man whose early warning went unheeded. And the cries of distress from beyond the Arctic Circle did not go unheeded. The presses of all the world soon took it up and a deluge of reporters soon flooded the big house on West Eighty-third Street.

Then one day the temperature of New York City took a sudden drop of eighteen degrees. One noon it was seventy-two, the next noon it was fifty-four. The metropolitan cities of all the world sent in similar messages telling of similar woes. The coming cold was beginning to show its cruel teeth.

It was at this time that the rich amateur of science became irritated. The belated halo did not seem to fit him when revenge was so much sweeter. Almost overnight his home had become the much sought after Mecca of scared men and women and of enterprising reporters. To those few of the frightened ones to whom he deigned to give audience, his sarcastic advice was to buy land in Yucatan. "What to do here? Wish he knew. Why worry, what have *you* to lose? How much? Huh, what about myself with a street car line at stake? Oh, you'll build yourself another house farther south. Lots of vacant land in Brazil and the Argentine. How should *he* know where the frigid zone came from? Well, it can't be helped. It's not my fault, so please don't look at me like that. Nonsense, there was still ample time. The glacier will not be here to-morrow. No he couldn't say just how long it would stay or what it would do. He was no prophet. Well, then stick it out if you feel that way. Certainly it would destroy New York City. Other cities too—plenty of them." And so on and so forth.

Then came the news from Alaska, which brought the glacier closer to home. Juneau was under a hundred feet of ice. A huge moving sheet that extended for many miles over land and sea had suddenly popped up overnight and crushed the town, leaving no survivors to tell the tale. Alaska shipping, southward bound, was overcrowded and from the half dozen large seaports on the Pacific, three-score steamers were heading swiftly toward the land beyond the Bering Sea. A hundred thousand terrified refuges were even now moving southward overland or awaiting succor by the sea, killing, fighting, mobbing for life. Also much of the population of Canada and of the northernmost United States was already moving south. The southern cities were expecting a huge influx from the north and were preparing for it. So too were Mexico and the rest of the Latin-American countries, all of them getting in readiness for a vast and undisciplined army of terrified and desperate fugitives from the north.

In Europe and in Asia the situation was no different. From London to Moscow and Tokio every city reported tremendous climatic changes and Stockholm had a snowstorm in July. Berlin told of huge ice-cakes in the River Spree and the harbor of Leningrad was entirely frozen, locking in its icy embraces scores of ships of all nationalities. There had been severe riotings in both Copenhagen and Amsterdam, in which troops let loose machine-guns upon desperate mobs of citizens. Tokio reported a drop of twenty degrees and Pekin of twenty-six. The harbor of Vladivostok in Siberia had long ago become ice-bound and a series of huge blizzards had stopped all traffic on the trans-Siberian Railroad.

All this happened only one week after the first call of distress from Captain Jensen and his luckless ship, a prisoner in the Arctic Circle. The Sixth Glacier was knocking on mankind's door.

LIKE all of the northern and the far southern world, the population of the British Isles, Scandinavia, north Russia, the Teutonic countries, Japan, Siberia, and northern China were fleeing towards the equator before the icy menace from the pole. Towns became evacuated overnight, cities were deserted in a week's time. In London rioting and looting were rampant and armored cars, artillery, and tear-bombs were freely used by both the police and military. Spain and Italy had suddenly enacted very drastic immigration laws and a newest war-cloud was once more hanging ominously low over Europe. Every English seaport town

was over-crowded with mad and excited people, anxious to leave their little island trap. Shipping was accompanied by bedlam-like scenes and several huge holocausts broke out on the wharves. Chinese soldiers in Pekin and in other Chinese cities were killing panic-stricken Chinamen, who were mobbing government offices demanding free transportation to the south. Turkey very wisely opened up her doors to all newcomers and then went south herself. Budapest's slum districts were afire. There were revolutions in Roumania, in Bulgaria, in Armenia, in Poland, and the Don Cossacks were demanding something or other. A queer race, this race of ours. News from overseas told of a heterogeneous jumble of terrific accounts of fires, murders, mobs, pillagings, riots, revolts, and mad attempts to flee the icy fury from the pole.

The day before the burning of London, and the subsequent fighting between armed mobs and the soldiers, found me once again a guest in West Eighty-third Street. Edinburg had just told of a blizzard and Liverpool reported that the Mersey was almost solid and shipping circles were at their wit's end.

Due to their locations so much farther to the north than the cities of the western hemisphere, the countries of northern Europe and Asia suffered the advent of the glacier a good while before we did. India's torrid land is on one latitude with the central part of the United States, while Labrador and London are almost face to face. The Gulf Stream going north with its hotter waters from the equatorial regions, brings with it the heat that makes a temperate land out of the British Isles and the countries of northern Europe, and then as this stream turns south again and becomes the cold Arctic Current, its frigid waters from the polar zones help to make the rigid winters of our otherwise warmer Atlantic seaboard.

A THRONG of people out of every walk in life had so surrounded the white mansion that a special cordon of police was found to be necessary. The amateur scientist, who had become internationally famous in one fortnight, had given strict orders to allow no one who had come without an invitation, into his home, and a big force of special detectives rigidly observed orders. A bullet-headed police-sergeant, wide of shoulders and huge of feet, accepted with a look of suspicion the story, that my invitation had been given over the telephone and thereby was of necessity, a verbal one. A minute later I was behind the huge door and in the presence of the amateur-scientific multi-millionaire. Three other men, one of them very stiff in an army officer's uniform, were also seated.

"How are you, Bender?" said the man of science in a somewhat gruff voice and without arising from his plush arm-chair. That over, he turned to the trio before me, as I slunk without noise into a rather unobstrusive part of the room and took the rôle of the silent though interested listener. The talker's voice implied a mixture of sarcasm and impatience. His mood seemed to verge on boredom.

"Of course" (he was eying the khaki-clad man, a major-general in the army) "the Antarctic regions will come north. That is they will expand because of the cold, as we enter the more frigid core of the nebula. It isn't cold yet. It hasn't really begun yet. We're only on the fringe of the belt. I cannot say exactly how far the glaciers will extend, though at a wanton guess I would put the latitudes of Buenos Aires and of, well let's say Los Angeles, as their respective border lines. Certainly not into the tropics. Those regions will be our sole refuge from the glacier and maybe our future homes, where our future years spent in the frigid belt, will be cool ones, while the northern and southern parts of our globe will be uninhabitable, maybe even unapproachable. I base my conclusions on the extent of the glaciers of the past, but don't let that keep you from moving to Brazil."

"Isn't this the end of the world?" broke in one of the civilians of the seated trio, a short, pudgy city official of advanced years and a very bald head. He appeared to be badly frightened.

"How should I know?" snapped out the hero of the times. "Am I a prophet."

The little man reddened and said no more. The army officer glared at him.

"My advice, gentlemen," continued the erstwhile speaker, "would be a hurried southern flight for all of us. There is plenty of room in the tropics for everybody and the change will do lots of people good. Of course, those countries will not be as torrid as they are to-day. The frigid belt and the neighboring Arctic countries will see to that. The world has had its equatorial palm-gardens but their setting sun is even now at hand. The tropics will be temperate, with snowy winters and cool summers, lands of fir and pine. The temperate zones will be Arctic, and Lord knows what the Arctic zones will be. Yes, gentlemen, our winter days are here."

"BUT what about the population, the people?" The military man was speaking.

"Well, what about them?"

"They'll freeze." In an anxious tone of voice.

"They can get out, couldn't they? I see no one chained."

"Yes, yes, but—" a pause. "Imagine the exodus. Here in New York for instance, a city of five million of every class on earth—millions of men, women, and children, babes in arms, in a mad stampede toward the south. Riots, disaster, looting, murdering. Think of it. Washington has already ordered every available regiment northward. What would our meagre transportation facilities amount to in the face of so huge an emigration? And the lands through which they need pass! Think of them. Barren, sir, that's what they'll be. People will fight for food. Tear one another to pieces. It means war to the hilt.

"Trampled children, tired women falling by the roadside, the aged, the crippled abandoned" (here I noticed that the corpulent city official was nervously fingering his derby hat) "to a cruel fate. The terror-stricken people will rise against their superiors, upon whom they had learned to rely." (The corpulent one gave a sudden twitch and dropped his derby). "The southern states

will become overcrowded and the result shall be war, because the refugees will be desperate men and women.""

"I guess they will be," the scientist interrupted him.

The general had just opened his mouth to continue his tirade, when the city official interrupted again.

"Can't you help, sir?" he began in a very weak voice, "Can you suggest something?"

"Move to Cuba." (In an offhand manner).

"But the people?"

"Let them move to Cuba, too."

"There'll be mobs," the soldier resumed, "terrible fighting caused by hunger and fear, and they'll stop at nothing."

"Oh, they'll find a way out, general. Of course, many will die, but just as many will be saved. Everyone can't be lucky."

The third man of the trio surrounding the scientist had spoken, and though his back was turned toward me, I immediately recognized the voice to be that of young Paul Eberle, an old friend of the Dunraven family, whose father at one time had been the partner in business and pleasure with the ex-traction head. I felt ill at ease, for I knew only too well that Paul Eberle had left his Chicago home for but one reason, and that reason was Clara.

THE feline-footed Jap serving-man entered, as silent as a tomb, and without noticing the presence of any of us, and with an expression like a vacuum, handed his employer a telegram. Stephen Dunraven read it very rapidly.

"News from the Antarctic, gentlemen," he said in a thrilled voice and with a slight sideway glance at the tall man in khaki. "I've been right again. Listen to this. 'Huge ice-fields have covered Wilkesland entirely, a mile thick.' Wilkesland, by the way, is that part of the Antarctic which lies directly south of Australia. Falkland Island is a second South Pole. The temperature of Buenos Aires is 14° F., and three inches of snow fell last night in Rosario, three hundred miles up river. Also there is fear for the Schwentner Antarctic Expedition, and that fear is only too well founded. Karl Schwentner has made his last exploring trip, rest assured. You see, gentlemen, I am well connected with the outside world even if I do but seldom leave my little castle on West Eighty-third."

An uncomfortable silence followed. Paul yawned audibly. Obviously he was very indifferent to the conversation. The general was humbled, but he remained stiff and soldierly. The little city official (I think he was an alderman) was still nervously toying with his derby. Stephen Dunraven glared into empty space.

The little Jap, a coffee-colored statuette from the Orient, had stood immobile behind the corpulent magnate's chair, ever since he had brought in the telegram with its cataclysmic news.

"Better get your overcoat ready, Ido," said his employer. "Cold days are ahead of us. Winter soon. A big hill of ice is coming and it's coming fast. Yea, cold days soon."

The little dark-skinned fellow spread his mouth into a long grimmace and showed a row of lacteal white teeth.

"Plenty warm in Nagasaki," he answered in a low tone, never moving from where he stood. "I go Nagasaki when cold ice come here."

"Plenty cold in Nagasaki too, Ido," responded the former speaker. "Soon ice everywhere. Better go Panama."

The Jap grinned once more, bowed, and then passed noiselessly through the door, where the gloom of the long hallway took him from our view.

AN hour later I was alone with the rich man whose hobby was science. A wild, rash idea entered my mind and I found myself unable to dislodge it. Paul Eberle's presence had put it there. I cannot recollect what I said, how I said it, or how much there was to it, but totaled up it amounted to a plea for Clara's hand. I have a faint recollection that it was as eloquent and as pathetic as it was lengthy, yet somehow or other it never affected the older man.

"See her about that, Bender, not me," he answered my fifteen minute speech in the most off-hand of tones and without looking up. As I left the house, I decided to take his advice. Faint heart ne'er won fair lady and a proposal by proxy is no proposal at all.

CHAPTER V

The Fury From the Pole

ICELAND had become as its name implied, a land of ice. Newfoundland and Leningrad voiced their final cries of distress at one time and three days later both Scotland and Sweden reported the first sight of the moving fields of ice, and Norway followed in a belated message, a day after them. The trans-Atlantic routes had become a death-trap of floating icebergs, Brobdingnagian mounds of ice that glittered like immense jewels in the sunlight. Airplane bombs of thermite proved ineffective in the face of this newest menace.

The southward migration of the vast hordes of northern Europe had already attained a prodigious magnitude with the stricken nations carrying to safety their priceless treasures of art. Military guards on the Swiss-Italian frontier had fired upon a caravan of scared burghers from Germany and Holland, killing many. War seemed imminent. A small fleet of British steamers loaded down to capacity with their human freight, were refused port at Barcelona, whereupon British warships opened fire upon that luckless Spanish town; the results were several beached vessels and a huge conflagration. North and south China were at one another's throats and the Japs disregarded openly the warnings from Washington that any further attempts to land emigrants on the shores of Hawaii or the Philippines would be considered an overt act of war. Every nation wanted to fight for what it considered its rights, if only for a few days.

On this side of the Atlantic, the situation was very similar. On the day following the Scotch message, the state of Alabama, already plethoric with northern

refugees and an unhappy victim of every manner of vandalism, decided to shut her doors. The militia was quickly mobilized and artillery and machine-guns were placed along all highways, railroads, and rivers. Sanguinary fighting took place between the guardsmen and the refugees. Other southern states soon followed suit and added fresh fuel to the already lively fracas.

NEW YORK CITY was in the grip of terror and uproar. Her East Side ghetto districts were a series of noisy madhouses day and night with which police and militia both were unable to cope. The inherent emotional trait of the peasant manifested itself in wild orgies, mad religious revivals which bordered on insanity, and desperate riots which always terminated in the shedding of blood of overworked policemen and of fire-brigades. The other districts, however, were more sober. Viewing it all in retrospect, it appears to me to have been just like an angry beehive that had been disturbed by rude hands; bees flying about everywhere, buzzing madly and bent on wicked errands, yet in a hodge-podge, aimless, and crazy way, combating one another in an effort to evade the foe of all. Nobody appeared to have any direction save a hazy tendency to the south, and no one had any idea how to go or what to do there. Wrecks of cars lined the roadsides unheeded by anybody, and here and there a gruesome funeral pyre of shattered wood and twisted steel told its mute story of what scared men can do. Railroad service was irregular and congested to an overflow. Wrecks were innumerable and the death list is a long one. The sixth Glacier was indeed beginning to take its toll of lives long before it came upon the scene.

ON the eleventh day of July, England reported a very severe blizzard, which was accompanied by a prodigious drop in the thermometer. The same report told also how northern Scotland had finally been reached by the advancing fields of ice. Christiana now Oslo, Norway's capital city, told of six feet of snow within her city limits on the day following the English message. Other reports came next, terrible reports that told of deaths, fires, panics, and battles. Edinburgh and Glasgow had succumbed almost simultaneously, one London wire said. A monstrous wall of ice that advanced southward at the rate of about three miles a day crushing everything relentlessly before it, fell upon them and found them bereft of living creatures.

Denmark was the next victim. Copenhagen reports had it that about half a day before the face of the glacier appeared, the thermometer fell very noticeably; this was attended by strong northern winds and a heavy snowfall out of a sky that was as lead. Huge cakes of ice battered themselves together on the waves in the harbor, finally to come to rest in one unbroken layer, jagged and peaked, that covered the water as far as the eye could see. Then like a wolf gone mad with days of hunger, a ragged wall of ice, fully fifty feet high, suddenly came from behind the curtain of falling snow in from the sea and threw itself without mercy upon the doomed city. In one day's time Copenhagen became one with Babylon and Troy, a crushed city under thousands of tons of jagged peaked ice.

London, blazing in the snow-storm, held out stalwartly for nearly two whole days, her final message to the world being a report by wireless that told of three feet of ice in Trafalgar Square. Stories were told later—stories too gruesome to report—of forsaken men and women who waded into the cold waters of the Channel with voices wailing, and arms extended toward the last of the vessels that were moving pitilessly out to sea, braving the huge bergs that were everywhere—of sieve-like boats never heard from again that took to sea their mad human cargoes, who feared the glacier more than they did the deep—of desperate mobs fighting madly, crushing one another on piers and docks, and floating bodies that icy waves cast back upon the shores—of futile last attempts, wild bids for life, huge bonfires built, walls erected, ditches dug to stem the fury from the pole. Stories came of mad fatalists, who died with fanatical eyes looking toward the sky, many cursing their native England that had proved so terrible a death-trap to so vast a number of her sons and daughters. And the background of this picture was a burning city.

GERMANY came next and France followed not far behind her. But from Berlin or Paris, the news was the same. Cold winds, snows, a blizzard, and then a day or two later a huge wall of ice, a moving plateau behind the descending curtain of white, an ice-field that seemed to have no end and that mounted higher and higher as it advanced and crushed underneath it five thousand years of civilized labor. Those who had fled to the hill-tops saw the terrible scenes in the valleys below them and some of them survived to tell the tale.

In Asia, after the bleak tundra lands of Siberia had been made short work of, the big, overcrowded cities of northern China were the first to bow before the polar king. Oriental fatalism coupled with the intrinsic secretiveness of the dwellers of the East has kept us from an exact knowledge of what really took place in the Chinese cities when the glacier came. From the few stories that have filtered through and have by now become history, the destruction seemed the same as elsewhere.

Of all our states, Maine was the first victim of the boreal foe. Canada had just been covered, her cities crushed and her eight million population dead or scattered, and all of northern Europe and Asia was one vast ice field when the United States first felt the shock. But the glacial vanguard found a land bereft of humanity, when it crossed the Canadian border and entered Maine. The evening of this same day found me supping at the Dunraven table in the old white mansion on West Eighty-third Street.

The amateur scientist was jubilant. The formerly inattentive press had not only vindicated him, but had actually thrown themselves at his feet, craving pardon and begging advice. He was the most sought after person in a madman's world and to him, revenge was

sweet indeed. "Let 'em freeze" was his favorite phrase.

"Boston is getting colder" my host remarked, his eyes glued to a long telegram. "There is half a foot of snow on the Common and more coming down fast. The harbor is frozen in places and the N.Y.,N.H. & H. R. R. service has been curtailed due to man-shortage.

"Ha—what's this? Uh, a plea from Chicago to come quick and save their city. 'For God's sake,' it says. So they've pricked up their ears at last and are beginning to listen. They've thrown aside their scandal sheets and are looking to science for something more than inventions of soda bottles and safety pins, eh? Oh, well, folks, sorry, but I cannot help. I can do no more to keep the glacier off your town than you can. Get out, is my only advice. You had plenty of time to beat it. You were warned months ahead."

ON my way back to the hotel, I encountered a long procession of shouting paraders. Cries to heaven were coming from a hundred vociferous throats. To them, excited Seventh Day Adventists, it was the end of the world, Christ's second coming. On a corner, a bit farther down the street, a rabid, shouting revivalist was exhorting to penitence a shivering crowd, part of which was kneeling in the snow. Across the way from him a Salvation Army group was holding a big throng with music and song. Many of the men were bareheaded and a few excited ones were shouting. Still farther down, a little elderly lady was standing on the rear of a text-besmeared Ford truck and with tears in her eyes, talked of Armageddon, the end of the world, and of preparedness. A few steps from my hotel an excited young man asked me if I was prepared and then without awaiting an answer, thrust a paper into my hand and hurried away. It was an invitation to hear one Reverend Armitage explain "the true cause of these terrible times that show that worldliness is rewarded only with death, and to tell the results that are soon to come." The world had suddenly awakened to the fact that their worship had been but church-adorning, conventional, and parrot-like lip-service, and now that fear had become their master, like drowning men grasping at straws, they turned toward the unknowable.

AND the snow fell and the sun was never strong enough to melt it and so it became ice and the rivers froze and the seas also, and pushed by its own weight, this became the glacier, and the world shivered in the biting winds that hurried from the ice-fields to warmer lands. North and south the tall, icy skyscrapers from the pole lifted their heads and a blizzard-mown plateau of ice stood at their back.

CHAPTER VI

The Panic

NEW YORK CITY, white with the snow, had dwindled down to a mere half-million population in two months' time. Rioting had abated and no police was necessary to keep in order the foredoomed metropolis. Detroit, Denver, Chicago, Omaha and Philadelphia all reported the same. Silent, dead cities where men and women walked the streets like so many ghosts, as if expecting the fall of the dreaded doom at any moment. Seattle, Portland, and San Francisco felt a bit secure on their warmer Pacific coast, while Los Angeles was boastful and jubilant. The exodus was still going on, the tail end of a gigantic, mad parade. The Dunraven domicile was still the last court of appeals to the ones to whom hope was a thing alive. Once, as I entered its high, wide portal reminiscent of a gateway into some medieval stronghold, I almost collided with the pudgy figure of the little bald-headed city alderman, whom I had remarked before. He apologized meekly and still twitching his derby hat in a nervous manner, hurried down the stairs.

"Damned fool," commented Dunraven, before the little man had time to reach the sidewalk. "What does he think I am? A second Aladdin with a magic lamp? I can't see what he's so excited about. Wants me to engineer a plan, a long line of big furnaces or heaters from coast to coast to melt the glacier as it arrives. What do you think of that for an asinine idea? If they want furnaces let them build furnaces. I'm going where it's warm. This winter climate doesn't quite agree with my gout."

That night I shook his hand at the Mineola air-field.

CLARA was with a maiden aunt in south Texas. Paul was in Panama. I was in cold New York City, a worried man. The periodical with which I was connected and which gave me bread and board was preparing for an aerial voyage to Tampa, Florida, and I, unhappily, was destined to remain in the north and send down the reports of my observations as the glacier advanced. I felt like a lost child in a forest of very tall trees.

Chicago, Denver, Omaha, Philadelphia, Kansas City, and New York felt the chilly grasps of the Sixth Glacier at about the same time. Detroit and Minneapolis had long ago succumbed. The high altitude of the states of the midwestern plateau did not prove to be a barrier. The Rockies, that tall backbone of the continent, held the glacier back in place for a brief time but soon the oncoming wall of ice merely divided itself upon the mountains' crest and like a huge tidal wave swept away everything in its path. On the fourteenth day of August, a big snowstorm raged over the Atlantic seaboard from the Potomac northward and east from the Appalachians. New York City became as Montana in mid-winter and a curtain of flaky white fell like a milky pall over everything and left behind it a two foot depth of snow. A strong north wind prevailed and the thermometer dropped to eight below the zero mark. The Hudson River was one solid ribbon of ice covered with twenty-four inches of frozen snow. Two river boats, appearing for all the world like a couple of very squat, white toads in the misty, snow-bound distance, were locked fast in the chilly embrace of the frozen stream. From the dock of one of the Hoboken ferries, I was able to make out the dim smoke of a burning town on the Jersey side curl up toward the leaden sky like a gigantic ostrich feather waving in the wind and snow.

THEN one day Nature mocked the barriers that she herself had erected, and crossing the tall Carpathians and the taller Alps, entered the flatlands of southern Europe. The news fell like a crack of doom upon a hopeful mankind and once again there was a stampede of madmen toward the south. The cold Mediterranean Sea became the graveyard of countless unfortunates.

London lay crushed under a thousand feet of ice. Paris was daily awaiting a similar fate. Rome was freezing. Madrid reported fourteen degrees below the zero mark on the same day that the glacier crossed the Alps. Tokio and Pekin were both in the throes of an Arctic blizzard while our own Pacific cities began to fear the worst, despite the warm currents from the tropics.

Day and night I remained within the warm confines of the red brick edifice which housed the offices of the *Scientific Union,* eating and sleeping within arm's length of the improvised wireless set which alone kept me linked with the small portion of the outer world that was unfrozen. However, now that I knew that I too must soon follow, a happy man indeed was I to know that in the shed below a high-powered automobile sled was even now awaiting my disposition.

I think back to those last few terrible days, as I jot down these facts, which I observed, and I can recall how the blizzard grew in its might, how a deep white blanket became hourly ever deeper, and how the final remnant of a stricken five and a half million awaited in fear and silence the crack of doom.

Europe and Asia had ceased to send out their messages of woe. South America and south Africa, however, continued to tell their tales of the other glacier which came from the south. Once my set received the pitiful S. O. S. call of a Jap fleet of over fifty men of war that had suddenly been caught in a net of ice-hills in the region of Sekhelin. But those messages did not last long. In my mind's eye I was able to see fifty ships, big and small, in an ocean full of icebergs struggling vainly and gallantly in the face of their relentless and unconquerable foe. And then came a huge, solid wave that moved slowly yet terribly. When that passed the ships were gone. Only a jagged field of ice remained, immense in its solitude, each peak capped with the snows that were to remain for years and a blizzard played furiously upon its breast.

A last word came from Boston before that old city of patriots went down, a cry of warning. Albany, Buffalo, Cleveland and some other nearby cities kept in hourly touch with me, each one of us exchanging reports. Now the last of the Great Lakes had frozen solid, a motionless body of ice; now Niagara Falls roared no longer, and then Chicago reported the glacier only fifty miles away.

The wind had abated and with it the blizzard died—died venting its fury on the ice-bound land below. Only a steady white stream of falling snow-flakes remained as ushers of the Juggernaut of ice that would come on silent feet and crush everything in its path. I took advantage of the lull and wandering about a bit came in front of the tall Woolworth building, that mammoth tower among mammoth towers. A sudden impulse overtook me and a half hour later I was on its top. Below me stretched a landscape as white as milk, as silent as the grave, while above me the falling snow hid a lead-hued sky. My eyes pierced the curtain of white and dimly made out the snow-covered Statue of Liberty, a forlorn lady, still holding the guiding light in one bronze hand. The Brooklyn Bridge across the East River appeared like a long white ribbon, losing itself in a distant drift. In the distance and across the frozen Hudson I saw a pink speck and a hazy column of taupe colored smoke that wafted heavenward from it. The town of Paterson was afire.

NIGHT found me safe home again. The snow continued to fall and to deepen the soft, white carpet that was everywhere. A solitary message out of the air broke into my slumbers at about midnight. A confederacy of scattered European nations had established a temporary group capital at Buluwayo in the state of South Rhodesia, Equatorial Africa. Woe unto the poor black man, I thought, the white man has come to stay. With that I went back to bed and a dreamless sleep.

When morning came the snow had stopped falling. But the sky was the color of old, used canvas. The thermometer stood at twenty degrees below the zero mark and a strong north wind was blowing. No more messages came from Albany, Rochester, or Buffalo. The northern part of the state was silent. During breakfast Chicago spoke—two words: "It's here."

CHAPTER VII
New York City Under the Ice

FOR the sixth time since life on earth first sprang into existence in the torrid mud seas of its early Paleozic days, the polar ice was slowly coming down again, upon the unsuspecting world, crushing everything in its frozen path. Peace and quiet reigned save for our ubiquitous bickerings, such petty affairs in this grand scheme of things, and then came the glacier. Once again Nature had won and was even now gathering in the stakes, cruelly, relentlessly.

UNDER the cover of the ebony of a starless night, like a wolf upon a sheep fold, silently came the glacier upon fearful New York City. Only the noon before a fur-clad individual, bewhiskered and very excited, a telegraph operator from Poughkeepsie, dropped in to see me. He had stuck valiantly to his post to the last, and left only a few hours before the ice came behind a curtain of storm. I welcomed him heartily, for he was the first human being that I had seen in many a day. He lingered only a few minutes, told me in an excited voice that the glacier was even now battering at the portals of the city, and then with a hasty adieu, commenced his long sled journey to the southlands. An hour later I, too, was speeding across the snow covered, lifeless Jersey plains.

Near Trenton I encountered a group of government aviators on observation duty and a wild idea entered

my head. Anyhow, I was still a reporter, a representative of a periodical, put here on the scenes of disaster to observe and report the transpiring events. Why should I not get one last glimpse of the big metropolis, which for over a quarter of a century had been hearth and home to me, the place which had harbored my loves, my hates, my hopes. I must defy this relentless boreal fury. Ye gods, what a scoop! What a headliner! And all my own.

I went up in the airplane. The sky was low and leaden, a dull unbroken canopy of grey clouds that obscured the blue of the firmament, but the snow on the ground below was as a mirror and thus there was no dearth of light. New York City lay beneath me swaying to and fro as the plane wavered in the gale, an octopus of a city, milk-white, tomb-like. Everything was quiet and dead.

We hovered a little over a thousand feet above the city. I could clearly make out each individual building below me. In the distant north snow was falling. It was the curtain behind which the icewall slunk. The long, thread-like, streets below bobbed up and down before me as my aerial charge, like a light craft on a choppy sea, bounced about in midair. I did not dare venture too far into the teeth of the gale. I had to be satisfied to watch it from a safe distance as it drove before its fury huge clouds of snow. I saw the havoc of the wind beneath me. I saw the leaden mantle of the sky above me, and to the north of me the curtain of snow. Even as I looked this curtain seemed to be rent asunder. And then, like the high prow of some Cyclopean ship, the icy nose of the glacier tore through the storm. Into the residential part of the city it tore—with the roar of a thousand Niagaras, the fury of a thousand miles, and before its might man's handicraft gave way and was crushed and plowed under by ice.

IT was a wonderful and terrible sight. A solid mass of glittering, scintillating ice, a huge chilling ploughshare nearly one hundred feet high that bore behind it the weight of a frozen continent, cut a wide gap into the scene below and house after house, block after block was hopelessly shattered. In an echelon formation, like the battle-phalanx of Alexander's conquering Greeks, it paved a way for the newest ice-age. Somewhere far in the rear, perhaps hundreds of miles behind, a grand upheaval must undoubtedly have taken place and hurled suddenly and unexpectedly upon its wretched victim this pointed mass that was supposed to come in a more leisurely fashion, a huge field of ice that rose in height as it stretched northward, peak after peak, vale after vale, and lost itself in the mist of the falling snow. With the speed of an express train it burst out of the curtain that fell thickly from the massed, gray clouds. The glacier that so far had advanced so slowly and had behaved so well had suddenly burst its gyves and spread rapid destruction in its wake. A second sufficed it to cross the narrow Harlem River and fix itself on the main part of the gigantic city. Then through the once thickly populated heart of Gotham, it swiftly swept, spreading a landscape of tall, spired peaks white with freshly fallen snow, crushing, tearing, rending asunder. Like the prow of a speed-boat the tall apex of the phalanx struck the congested, world famous business district of New York. For one awful moment the huge buildings, marvels of the engineers' genius, held their own nobly. Then they wavered a bit, some of the exterior masonry coverings fell off and buried themselves in the three feet deep snow on the ground below and exposed the steel girder skeleton framework from underneath the brick and stone, then as a hundred-billion tons of ice pressed irresistibly forward, the big edifices crumpled up and became one with the past. One big, slender tower, a finger of steel and stone pointing at the sky, broke into two and fell. A row of huge office buildings, mighty structures of concrete and steel, were brushed helplessly to one side and crushed one upon the other as the ice advanced. The sturdy Municipal Building, hardiest of them all, valiantly held its head high until one side of the icy echelon brushed along it, tearing away much of its lower concrete. Huge pieces of ice broke off the main body of the cold plow-share and piled themselves up talus-like, almost to one half of the height of the tall edifice. Even when the greater part of one wall was already gone, steel-work and all, and the building itself was slanting awry, the ice continued to pile up around. Still it stood. And then it was pushed to one side, indifferently, just as some obtrusive clod of earth is pushed out of the path by a plow. For a moment the gigantic structure struggled as though it were a living thing. From a bird's-eye-view, it seemed a huge, antediluvian, unearthly living thing. Uprooted from its solid base of deeply sunk caissons, falling to pieces bit by bit, I watched it as it traveled for a hundred yards or more with the swiftly moving ice-prow of the glacier, a skeleton of a building, shattering its smaller neighbors in its final bid for existence. Its naked dome toppled grotesquely to one side like a drunkard's hat. Then like a house of cards it fell to pieces, hundreds of tons of steel and stone. But the glacier heeded nothing. It merely moved on, bayward, southward, a jagged field of ice that stretched for miles toward the pole. It brushed the tall Statue of Liberty to one side, and threw it heavily into the ice-covered water, hurling huge cakes of ice high into the air, and then lifted little Bedlo's Island bodily out of the bay. It tore the long bridges, from their stoney foundations and then crushed them to pieces underneath its icy feet. New York City had become one with Nineveh and the hoariest of pasts in fifteen minutes. In the distance and toward the north the snow still fell.

A RIGID Arctic winter had set in. The sun shone feebly, a weak spot of light in an opaque sky. No Aurora told of the sunrise, no gory skies afire told of the death of day. A brazen sky alone roofed the northern world, stretching from one horizon to the other.

We flew along the ice-bound coast, through the white state of New Jersey, over Delaware, and high above snow-bound Maryland. On the land below us the glacier never resting, advanced more slowly now. On the sea great cliffs of ice, hundreds of feet high and as

irregular as the waves that made them and thick with snow, faced the rolling waters and occasionally shed their giant bergs seaward—tall peaks with hoary heads that touched the gray canopy that blanketed the sky as they rode southward on the waves' crest. Here and there, on the whiteness below us lay motionless black spots, those of the retreating army that were unable to carry on. At one place a huge Red Cross sign, darkly outlined in the snow, told of succor and mercy, an outpost harbinger of solace in a land which knew of it but faintly. Once we passed low over a straggling caravan, a tail end of a mad stampede, hurrying before the icy lash of Nature as only those hurry, who know well that Death is the pacemaker. We flew low over Baltimore, deeply covered with snow, a mute city, silent and deserted, awaiting the doom of the inevitable.

The snow held sway as far south as Washington, D. C. In the Potomac huge cakes of ice, floated languidly while on its southern shore a small steamer was stranded and afire. The big Capitol building, a squat, milky monster, merged its whiteness with that of the snow. I saw the first sunshine in many a day in this doomed capital city of a scattered nation, a welcome orb that reflected its light on the white mirror beneath it and played havoc with the eyes.

We landed in Richmond, Virginia's fair capital, a city as old as the south—now a Richmond overcrowded with madmen. Festered with disease, hunger, and crime, with a homeless, terror-stricken populace, it awaited the glacier's coming sedately and with dignity, like an aristocrat.

Galveston harbor was a sea of naked masts, long, skinny fingers pointing arrow-like to the sky, like so many dead and scorched pine-trunks after a forest fire. Clara was in Galveston, living with a maiden aunt. Her father was in northern Mexico busy within the depths of his ruins. For my part our meeting was a happy one, though what impression my month's growth of beard and my unkempt person made on the girl, I could not say.

Washington went to her icy doom five days after New York City had met the same fate. It did not go with the sudden unexpected onrush of a sea of ice that wrote "finis" to the three-hundred year history of the greater city; it went slowly, like a huge pachyderm pushing its way through a forest of tender saplings, irresistibly and yet without concern. The huge Capitol torn from its age old base, was pushed along for about a mile by a fifty feet high ice-wall, crumpling to pieces as it went, its magnificent cupola falling to the ground at one half of that distance; and finally the thick masonry gave way and fell to pieces before the weight and ponderosity of the glacier. The tall Washington Monument, so eyewitnesses claim, broke into three pieces at the first impact and buried each piece in the deep snow at its feet.

I HAD scarcely been in Galveston for two days when an order from the new office of the *Scientific News* at Tampa reached me. I was to be there as soon as possible. A quarter of an hour later I was at Clara's house again for another farewell. Paul was there too, fresh from Panama, a merry sunburnt Paul, eager and furtive—in contrast to my haggard, care-worn self. He was endeavoring to induce Clara and her aunt to return with him to the tropics, now, alas, grown very temperate, indeed. I was a very happy man when I heard them refuse.

CHAPTER VIII
"Bender, We Must Do Something"

ONCE again I was looking down upon a sparsely covered pink scalp immediately above a pair of narrow shoulders

"Have a chair, Bender," said the little editor wearily. Undoubtedly he had been up late the night before. "Had a jolly cold time in New York, didn't you? Your story was excellent. Congratulations. You've certainly got the stuff in you and if the glacier doesn't force us back into the pre-Neolithic days I prophesy a great future for you. Mark my words."

I answered something or other in reply, almost inaudibly—a thanks, I believe. He seemed not to hear me.

"The world is panic stricken, Bender," he continued. "I too am beginning to see only the worst. To me it is the end. Yes, Bender, the finish. The last chapter of our civilization has been written and the Grand Author is even now putting the period in the final line; the book is complete and finished. Yes, Bender, we must do something; something to stop the ice. Do you think old Dunraven could help? A real big wall, a deep ditch, perhaps. A billion hands are ready to help. The Italians, so I hear, are taking advantage of the internal volcanic heat with which their little peninsula home is at one time blessed and cursed.

"We ought to be out of the frigid area soon. Good Lord, it can't last forever, and once out, the ice will go quick. The last glacier, if all indications are true, did not go farther south than Ohio and on this I rest much hope. It is not the thought that the glacier will cover up the entire surface of the globe that puts fear into my heart and makes me cry dismally that all is lost. It is the sadly terrible sight of humanity wiping itself out. When the sun shines again some day and we are free of the icy marauders from the poles, what a tiny wretched remnant will be saved. It will hardly be worth saving."

He paused for a moment and regarded me, but noting that I made no comments, continued.

"You see, Bender, it's like this. So long as we are in the cold belt, the sun's heat is nil, for the atmosphere no longer holds the heat. The seas and the inland waters freeze, and expanding, spread the frigid temperature. Like a snowball growing bigger and bigger as it rolls down-hill, the glacier feeds on itself as it goes, using its victims to garner in more. There is little news from Europe now. Spain and France both breathed their last a week ago; thousands perished on the ice sea which was once the Mediterranean. Italy is still holding out in her lowlands, but it is only a question of time. Greece is hit, though Turkey, as far as I know now, is still untouched, while Egypt

has had its first snow-storm in its sixty centuries of history. A white night-cap of ice and snow rests on the top of the world and is growing bigger every day. Yes, Bender, we must do something."

THE Himalayas proved to be no barriers. The glacier went through them like a hot knife through butter, tearing everything to pieces as it went. I pictured it in my mind's eye, the tall Indo-Chinese range, majestic, serene, invincible, defiant of time and of element, those hoary Asiatic pillars of the blue firmament of the Far East bowing down before the polar foe. Nature's mightiest rampart scaled at last and the sunny plains below at the mercy of the ice. Like a cinema display, a scene that in reality took weeks to enact, passed in a rapid review before my mental eye. I saw the slow advance of the tall ice-wall behind the curtain of falling snow, Siberia long ago conquered, China just surrendered, slowly, ponderously, a living, relentless entity twenty-thousand miles long, a thousand billion tons behind it. I saw it creep, hour by hour, into the arid foot-hills of the skyscraping mountain chain, swallow them overnight, and then push farther on. I saw it pile itself high over the deepest of chasms and the widest of gorges, and at the feet of the tallest peaks as the king of mountain ranges made its final stand. I saw it creep up slowly, through one mountain pass, another, into a valley and then swiftly across a plain, hurling itself forward with the weight of a world behind it, surrounding giant peak after giant peak like a living, crawling, many-armed hydra, mercilessly crushing the mountain villages that stood in its way. I saw the fight on the timberline as the ice arose, the big pines giving way like so much brushwood, up, up, until only the tallest peaks remained above the ice, tiny, peaked islands covered with snow and losing themselves in a gray blanket of clouds.

North Texas and the mid-west plateau states felt the grip of the glacier at about the same time that Salt Lake City did. Big bergs floated down the Mississippi, and jamming into one solid mass, made of the Father of Waters a river of ice. Those refugees who had only so recently been driven to seek newer homes in the southlands were beginning to feel uneasy again. On the first day of October Los Angeles was unanimously decided on as the capital of the United States. It snowed many inches deep that day all along the Pacific coast as far south as the Mexican border; nevertheless the Los Angelites turned out *en masse* to welcome the nation's noblest.

OF course the glacier's advance was not a matter of speed, except in the case of the destruction of New York City, whose unlucky remnant of once proud millions died in a trap suddenly sprung. Ordinarily the ice-fields moved toward the corpulent equator of the earth at the rate of about five miles a day, ample time for flight, though it would take longer in mountainous regions.

The admixture of homeless peoples who pressed madly into the iceless places of the world had very unwisely sought the seasides and the big cities instead of the more open plains and the jungle's almost unlimited terrains. The gregariousness of the herd animal, of which man too is a species, manifested itself in overcrowded cities where death, disease, and vice was rife. Others, however, were made of sterner stuff. Tent cities and long, even avenues of hastily constructed shanties sprang up as if by the rub of an Aladdin's lamp in valleys, in forests, and by the brinks of rivers and seas. These were the nuclei of newer nations to come. Forests were cleared and streams bridged, and prairies once given over entirely to wild grasses and wilder winds were plowed and tilled. Everything was done to cover freezing bodies and fill hungry mouths. At first showing signs of belligerency, the countries of the tropics, however, soon bowed before the inevitable, and powerless in the face of a billion desperate invaders either offered aid or assumed an indifference that verged on fatalism. It soon became a case of nations within nations, immense ghettos in foreign lands. Temporary seats of governments were erected and armed vigilantes maintained order without scruple or hesitation. Strict laws rivaling those of Lycurgus of ancient history were the immediate and natural offspring of those terrible times and death was the penalty for infringement. People desperately combated the baser elements of man which come to the surface when he is scared or otherwise caught unawares.

CHAPTER IX
The World at Bay

THE tall arboreal mammoths of our northwestern woods bowed before the titanic fields of ice, yet they had dared Nature's grimmest dangers for a half-score of centuries. California was invaded; the tall Sierra Nevadas were traversed by the glacier, and the southern deserts became its bed. And still the northern fury kept coming on—creeping slowly, mile by mile. One day Tokio sent a message that all was over. The next day Manila had a snow-storm.

On this side of the globe a wedge-shaped world of ice, like the prow of a Cyclopean ship, five thousand miles long, held in its grasp the biggest part of the land. Its point was north Texas, high and cold, and thence it ran in a more or less irregular line as far north as San Francisco on the west coast and northeast as far as the Virginia hills. South of it was a cold land of refugees driven from their homes. North of it a colder land of boreal storms. The Los Angeles vicinity was fast becoming an Arctic country and the prospects of hunting a newer national capital were becoming more imminent daily. Gray clouds hid the one time azure sky of the California city and huge ice-cakes covered her distant harbor. For one solid week the snow never ceased to fall and the streets were carpeted with a foot of soft, white flakes. Her huge population, swelled to overflowing by the influx of a myriad of homeless ones, was moving desertward hour by hour. Atlanta received her baptism of ice simultaneously with San Francisco and both natives and fugitives suddenly quit their erstwhile bellicose desires and became an army of stragglers toward the Gulf.

In Europe, Rome and Madrid were both under the glacier. Athens was a deserted city in the power of a raging blizzard solemnly awaiting an icy death. Practically all of Europe was covered before the Hellenes were reached. Constantinople was full of refugees and very cold. Cairo had been burning for a week, and Fez, Tuns, and Algiers were shambles. Buluways was made the temporary capital of the nascent European Confederacy, extending its boundaries, and primeval jungle and native bamboo village had to give way. Fighting with the blacks was a daily affair and the prey-birds of the air feasted and gorged well on human flesh.

From Asia came no news. India was one vast uninterrupted battlefield where yellow man and brown fought tooth and claw, one to find a haven from the glacier's cruel menace, the other to hold back from hearth and home a Mongol tide. The islands of the South Seas proved hell-holes for millions. Japan alone showed any signs of sanity. She took possession of the Phlippines, Hawaii and Guam and moved the stricken remnant of the Mikado's population there. The little island kingdom of the rising sun had proved to be like Britain on the globe's opposite side, a death-trap to her overcrowded millions. New Zealand was under and Australia was breathing her last. Sydney and Melbourne both reported snow while Ballarat was covered with ice. The southern glacier was coming to meet its northern ally, the jaws of the vise were closing.

ONE day I found a letter awaiting me at the new office of the *Scientific News*. In places the postal service was still in existence. The envelope bore the stamp of Mexico and even before I opened it the neat, almost girlish hand appraised me of the fact that the writer was none other than my scientifically inclined friend. He was very brief. A few lines (light green ink on pink paper, scented!), he thought, would suffice to tell me that he was at present at the site of his archeological "find" near Magdalena. He had discovered something new and desired my immediate presence. "Just a few lines for your sheet that will do it good," he wrote. And "I know that they'll allow me no more." He passed over the glacier simply by stating that he thought he had a remedy. Clara, he mentioned, was in Mexico City.

The next day I started toward Mexico and two days later was in Magdalena, a city of the living dead, where a million starving men and women eyed one another greedily, in constant fear that someone might want a bite to eat. Martial law reigned with an iron hand, a Mexican martial law that was bereft of scruples and knew how to be swift. A food-issue rule had been in existence for a long time and hoarders were shot. Dead bodies were daily carted out to the sandy edge of the overgrown town and there cremated. A pair of gibbets, gruesome reminders of the power of the law, graced the main plaza, and daily they bore the bitterest of fruits. Armed soldiers, with bayonets fixed, guarded the streets and lurked in every ally, so that Magdalena was akin to a military post or an invaded city. The laws were of iron and it was necessary that it should be so.

Now as I write reviewing those awful days, so hectic and eventful, and so terrible, it seems to me like some bad dream that existed only in the imagination. An ancient ruin found by a rich old man with a penchant toward science, a warning never heeded, the first cries of distress, two huge glaciers coming relentlessly, like the two jaws of a vise, from the two poles, a stampede of scared humans made desperate by their plight, a world of fugitives, and a world of ice and storms. To-day, in retrospect, it appears more like a nightmare of many years ago than the terrible reality that it really was. I recall the day upon which I arrived in Magdalena and immediately sought Stephen Dunraven. An hour later I found him in a dirty khaki-tent which evidently had seen better days, at the edge of the town, distant from the turmoil of humanity. The little Jap serving man,, immobile as ever, was still at his elbow, bowing and very polite, just as he had been before.

"How are you, Bender?" Dunraven greeted me in the gruff tone of a "bucko" second-mate ordering a surly sailor aloft. A hearty handshake gave immediate lie to the comparison. "Sit down next to me on this cot. Easy, it's broke. Ido, something to drink."

END OF PART I

What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a textbook. Moreover, most of the stories are written in a popular vein, making it possible for any one to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge.

1. Why do planets shine at night? (See page 875.)
2. What planets were believed to be inhabited? (See page 875.)
3. What astronomer upheld this belief? (See page 876.)
4. What is the force of gravity on Mars? (See page 876.)
5. How does Venus compare with the Earth? (See page 877.)
6. What are the distances of Venus from the earth at inferior and superior conjunction? (See page 881.)
7. What is the name of a very fierce tribe of Indians in Mexico? (See page 903.)
8. What action of the Gulf Stream affects England and the countries of northern Europe? (See page 909.)
9. What is the length of the "stadium," a unit of measure used by the Greeks? (See page 927.)
10. What is the more familiar name of God Poseidon? (See page 927.)
11. Can a reaction motor operate in a vacuum or does its action depend on the presence of air? (See page 950.)

CAUPHUL
THE CITY UNDER THE SEA
By George Cookman Watson

THE President of the Algonquin Trust & Deposit Company has authorized me to announce that on the 24th inst., the Ross Party Relief Expedition will leave on its mission from an eastern port. I am sure that the relatives and friends of the men who, with Mr. Darby Ross, are the subjects of this expedition, will be greatly cheered and comforted by this announcement. It has been deemed advisable not to disclose the sailing point at this time, owing to the usual delay and confusion that accompanies such a venture. After many weeks of investigation and conferences, an opinion has been handed down *in re* Algonquin, Trust & Deposit Company vs. Ross Trust Fund that makes it possible for the vast sum of money that has been held under this trust to be released for this purpose, and upon me has been conferred the honor of leading the relief expedition.

It is hardly necessary to state that I shall use every possible means to accomplish our purpose, and I desire at this time to express my thanks and appreciation to the many societies and governments that have kindly offered their services. Owing to the fact that so many wild and distorted rumors have been circulated regarding Mr. Ross and his associates, and the various speculations that have been carried on in our press since our disappearance beneath the waves from the deck of the yacht *Jean Valjean* some six or seven months ago. it has been deemed advisable by all parties interested, that I make a brief report as to what we found. This report will be released after the expedition is under way.

I will not burden the public with the many extravagant stories that have been published regarding our first exploration, but in passing will inform the *Times-Dispatch* that I am not confined in an insane asylum in Illinois, as they stated, and would call to the attention of the *Post-Intelligencer* that my wife is very much alive and enjoyed hugely reading the account that she was a spirit, clothed only in ethereal robes, and had come down from a distant planet. I shall give this report in the form of a narrative, and shall try to the best of my ability to do it as correctly as possible. But my readers will appreciate the fact that I only have a small notebook of data, and that I shall be compelled to draw upon my memory as well as upon the information that can be given to me by my wife, Nesta.

I met Mr. Darby Ross at the Alumni Club some ten months ago. He had just closed the deal whereby he had disposed of his oil properties for several millions of dollars, and, naturally, this had brought him somewhat into the limelight. Darby Ross was then just past thirty, unmarried, and possessed of traits that are worth mentioning. The first was that he had an insatiable thirst for knowledge—knowledge of the earth, the sky and the sea—and he often told me after our association that his greatest desire in life was to accomplish something that would be of benefit and interest, not only to the present generation, but to posterity and science. As it is problematical whether we shall ever see Darby Ross again, I do not think I am violating a confidence when I state that he is a man who is financing the digging of a well into the earth for the purpose of scientific study and investigation, which is now under development, and which will be driven to the depth of 30 miles. He is also the man that has secured the data for the highest known elevations so far achieved by airplanes; and his invention, the spectrophone, which will enable one to see the party with whom he is speaking over the telephone, will soon be placed in every-day use.

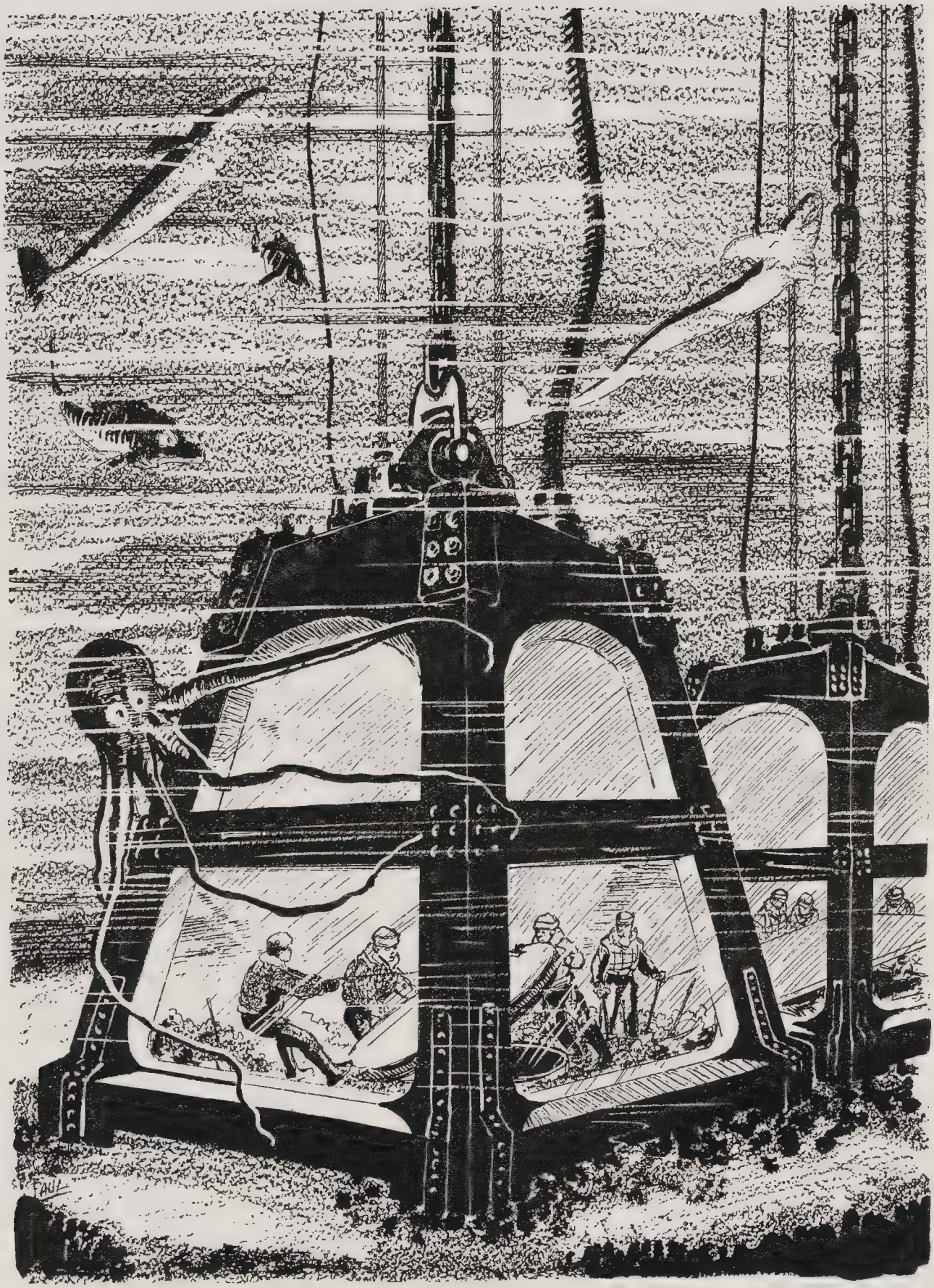
If I recall correctly, I was asked to take a hand in a bridge game with Darby Ross the first evening I met him. He was very fond of auction, and I can testify to his marvelous ability at playing this game. After we had played a few rubbers, the other two members of our game were called away, and it was then that Mr. Ross and myself had a conversation that resulted in his employing me as his private secretary. I cannot forget the impression he made upon me, or the earnest manner in which he stated that life was so full of sham and frivolity, and that there were so many big things to be done, yet the average person was content only with what concerned his own little sphere.

ATLANTIS stories have always been a favorite subject with authors and it is quite possible that a thousand different versions of a City under the Sea might be written without duplication.

The present story illustrates this point, and furnishes extraordinarily good reading. It contains a great deal more good science perhaps than many other Atlantis stories that have been presented in the past.

It has the additional feature of holding your attention to the last line. Indeed, we hope that the new author will present our readers with some more scientifiction from his pen.

The next morning, when I reported to his office, he opened the conversation by saying: "It is my intention, Gregden, to gather around me a body of men, each a specialist in his department, and to make a scientific investigation of the ancient and buried temples of Yucatan, and also to collect what data we can upon the Maya Race. I have here a list," handing me a paper, "of men that I wish you would get into communication with for this expedition. I leave it entirely to you," he said, "to arrange everything for the comfort, safety and maintenance of this expedition, and I have opened up



After penetrating a few inches, we came upon a bronze-like substance, which being cleared, proved to be a reflector. . . . At one side of the mound we discovered what appeared to be an opening into its interior, and much to our surprise in a few moments we had raised this shell.

for you an account with the Pacific National Bank for whatever funds you may need. I shall be out of the city for about ten days or two weeks, and upon my return I trust you will have the details all satisfactorily arranged." After I had gone with him to the bank and arranged about the signing of checks, etc., he bid me goodbye, and I returned to the office to carry out his instructions.

I made all the necessary arrangements for this expedition, and was fortunate enough to secure the men whose names he had given me. Upon his return to the city, we had our first conference in his apartments. The names of these men, who were destined to go down in history as the greatest explorers and discoverers of all times, are as follows: Prof. van de Gould, Professor of Ancient Languages, Mid-Continent University; Johann Corot, chemist and author; Howard Sayre, expert electrician; Dr. Wm. Forn, physician, late of the University of Charleston. These four men, together with myself, Sidney Gregden, were selected by Mr. Ross as his advisers, counsellors and friends for his intended explorations.

There is another that I must mention at this time, who, though not known to the scientific world, yet played a most important part in our subsequent explorations—John Kelly, able-bodied seaman, marvelous cook, and general man-of-all work, who elected himself the personal bodyguard of Darby Ross. It seems Ross had released him from the clutches of an overenthusiastic landlady and, attracted by the man's appearance and disposition, had employed him.

AT our first conference, Prof. van de Gould stated that he had just heard, through a friend of his, Professor Earl Crayon, the eminent anthropologist, and a brother teacher with him at the University, that some astounding discoveries had just been made in the Cliff Dwellers Region of Arizona, and suggested that we investigate them before proceeding to Yucatan.

"Can you get Professor Crayon to join this party?" asked Darby Ross.

"Yes, I think I can," replied Professor van de Gould.

"Well, then," Ross continued, turning to me, "send him a day letter asking him to join our expedition; and if you," turning to van de Gould. "think it worth while, we will investigate the Cliff Dwellers first."

Within the week, Professor Crayon had joined our party, and ten days later, fully equipped with all of the paraphernalia necessary for such an expedition, we started for Arizona. I need not dwell on the results of this trip, and shall only mention the salient feature, which was this:

During the last day of our stay there, no discoveries of moment having been found, we were seated under the shade of a projecting rock, waiting for Kelly to prepare lunch. As is always the case in parties of this kind, when men of diversified professions and opinions are thrown together constantly, a great deal of badinage is passed back and forth, and on this occasion Sayre was twitting Professor Crayon on not having discovered any good prehistoric skeletons. "I think it's all a matter of luck, anyway," he stated, slowly rolling a cigarette. "You don't know where these old dead boys are buried, but you can pick and poke about, and if you stumble upon a skeleton that has been peacefully slumbering for some thousands of years, you get all het up about it, and have his bones named after you, and get written up in the scientific journals, and think you are some guy."

Professor Crayon, somewhat peeved at the result of the expedition, testily replied, "All right, Brother Sayre, suppose we let you try. I think there is enough time left before Kelly announces lunch for you to discover a very good specimen."

"I'll just do that little thing," cried Sayre. Jumping up and grabbing a pick, he started off toward the cliffs.

"Hold on a minute." cried Ross. "Don't waste your strength in this hot sun digging around anywhere; let me show you a good place," and gravely walking out into the center of an ancient court, he made several mysterious motions with his arms, squinted up and down, then finally walking over to a spot which, if anything, was hotter and more bleak and desolate-looking than anything around, said, tapping his foot upon the ground, "Dig here, Howard, and great shall be your reward."

As he returned to us, mopping his forehead, Crayon said, "What on earth have you got him digging there for? You know as well as I do that they never buried their dead in the open like that, in the court, but up along the side."

"Oh, well, let him alone," said Ross. "The exercise will do him good," and, dropping upon the ground, he turned to observe the patient Sayre, who was slowly but carefully digging away.

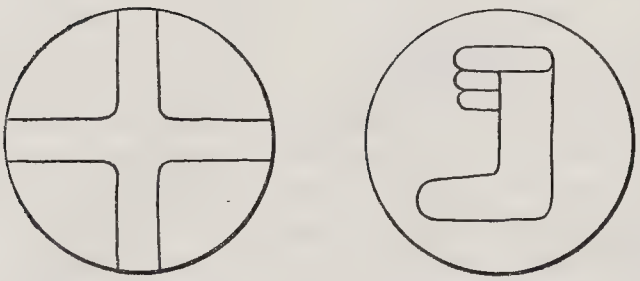
We were having great fun laughing at him, and at Kelly's call for lunch we all arose, when just at that moment Sayre started up. "Hey, you fellows, I've found one!" and stooping, he picked out of the shallow excavation a skull, which he held up to our inspection.

"Impossible!" muttered Crayon, striding forward. "Why, such a discovery there is out of the question."

We were all soon gathered around the spot, and there, much to our surprise, and to the delight of Sayre, lay a perfect human skeleton, about six feet long. Eagerly we bent over it. Needless to say, Professor Crayon was in his element.

WHILE we were all engaged in removing the skeleton and some pottery and utensils that had been buried with it, Ross picked up a small disc. "Well, what do you know about this?" he exclaimed, looking at it closely on both sides, then handing it to Prof. van de Gould. The professor immediately looked at it on both sides through his pocket magnifying lens, and in a voice tense with emotion, stated, "This is indeed a wonderful discovery." The metal was a peculiar substance, not known to any of us. Later we ascertained it was orichalcum*. It was about the size of a silver dollar, and about half as thick. On one side it bore this emblem: and the reverse side showed this:

*A yellow alloy, perhaps like brass, esteemed precious by the Greeks and Romans.



"What do you think it is, van de Gould?" Ross asked.

"Pardon me," interrupted Sayre, "but I think we are all very much interested in this discovery. I suggest we return to the shade."

The two brother professors carefully picked up the skeleton, while Ross and myself collected the various articles found with it. We then all returned to our camp, Kelly greeting our approach with a pathetic appeal that we proceed at once to lunch or his special omelet would be entirely ruined.

During the course of the meal, Ross asked Prof. van de Gould to give us the meaning of the inscriptions found upon the disc.

"This disc," he said, holding it up in his hand, "to the best of my knowledge, is an emblem which conferred upon the wearer the rights now imposed on an ambassador. This sign you see," pointing to the figure representing a boot, "is the ancient Maya letter 'A,' or the sign of the god Ad, the supreme ruler, and indicates that the wearer thereof is one of his messengers.

"We have also found," he continued, "a similar design in the ancient Phoenician alphabet, while some students of languages hold that it is from the Arian, and others that it was common to the early Mediterranean civilization. However, I think we can safely rely upon the fact that Landa's interpretation is correct, that it is pure Maya, or, more correctly, Colhuas, to whose civilization the Mayas succeeded about 1,000 years B.C. The reverse side," turning it over, "is almost the universal sign of both early eastern and western civilizations of the universe, the four angles representing the different points of the world. This, in my opinion," he continued, "would be pure Phoenician if, in the center, was the symbol 'X,' which would signify the sun."

"This, then, in your opinion, Professor," interrupted Ross, "would prove that the Mayas were not only themselves sun-worshippers, but that they were endeavoring to spread their religion among these northern tribes."

"This would seem to indicate it," replied the Professor. "Perhaps our friend Crayon can shed some light upon the skeleton."

Crayon leaned back, and lighting a cigarette, stated: "I have no doubt, gentlemen, but that the skeleton just discovered, thanks to the efforts of our good friend Sayre," bowing to him, "clearly demonstrates the fact, that van de Gould is correct in his supposition that he was an ambassador to these tribes. It is a well-known fact," he continued, "that the Maya civilization was of the highest order. We also have authentic historical knowledge of the fact that they endeavored to spread the doctrine of sun-worship among the then northern tribes of North America."

"Well, Professor," I asked, "would you say that he had been received among these people in a friendly manner, or that he had been put to death?"

"I would certainly maintain the theory," he answered me, "that he had been received among them with great honor, and that at his death, which would appear to be untimely, they had conferred upon him the highest honor they could bestow—burial in the Garden of the Sun."

THE discussion then continued back and forth between us, and we were just about to return to the skeleton, where the professors desired to make certain measurements, when Kelly, who had by this time completed his culinary services, came up to Mr. Ross. "Would you please . . ." he said, "May I see it?" indicating the disc.

"With pleasure," and he handed it to Kelly.

Kelly looked at it intently for a few moments, and then, handing it back, stated, "Now, how in the name of the saints do you suppose that one of these things ever got way over here? Sure, if it doesn't look strange to me."

"Why, what do you mean?" interrupted Ross.

'Beggin' your pardon, I have one of the self-same things mesilf."

"The dickens you have!" exclaimed van de Gould, scrambling to his feet. "Where is it?"

"It's over here in my dunnage-bag. I'll fetch it for you if you'd like to see it."

"Well, I should say we would," cried Ross. "Go and get it at once."

"Do you suppose that old Irishman has been doing some exploration on his own account?" quizzed Sayre.

"It begins to look," interrupted Crayon, "as though we've stumbled upon quite a find."

"I am more interested in where the man found it," continued van de Gould.

Kelly returned in a few moments and handed to Ross a disc, similar to the one that Sayre had just discovered. We eagerly crowded around him, and as the markings on it were somewhat indistinct, he handed it to van de Gould, who instantly gave it a searching study under his pocket glass.

"Ha!" he exclaimed, 'the very thing I have been looking for. See this!" excitedly indicating the center of the reverse side. "Here you will note the cross that I mentioned. This, gentlemen," he continued, excitedly, proves absolutely that the Mayas are direct descendants of the early Mediterranean races, and their civilization was acquired from the early Phoenician, or, I might say, Berber."

"Whereabouts around here did you find that, Kelly?" queried Ross.

"Sure, now, and if you good gentlemen think that I waste me time in prowling around dead men's bones, you have another guess comin' to ye. 'Tis mesilf that would let the dead rest in peace."

"Well, come on," Ross continued, "where did you find it?"

"Keep aisy, gentlemen, and I'll tell you the whole story." Seating himself upon the ground, he indicated that we should do likewise. Disregarding our impatience, he leisurely lighted his pipe, and crossed his hands behind his head, leaned back against a boulder, and then spoke.

"ME grandfather was a sailor lad, and when he was a youngster, about 18 years of age, he was in the British navy. On one of his trips he was with Capt. Tillard, and many's the time he's told me this tale. It was in the month of June, 1811, and they were off the island of St. Michaels, which, as you gentlemen know, is one of the Azores. They were cruising along under a fair wind when they saw flame and smoke and water shootin' up out of the ocean. Sure, me grandfather has told me many a time that he thought the old boy himself was after them. Well," he continued, "they landed at St. Michaels, and the captain and a few of the crew, among which was me granddad, went up on a hill and saw the smoke comin' right out of the sea and the waves all ripplin', and just at this time they had several earthquakes, and the old man said that he thought sure his time had come. Well, about a fortnight afterwards, having made the tour of the island, he started to return to England. While he was on lookout one morning, as the fog arose he saw a brand-new island, where a few days before they had seen the Devil's Whirlpool. He told me that the crew was for crowding on sail and getting away from the place, but Capt. Tillard was determined to find out something about the new island, so he lowered his gig, and my grandfather was ordered into the boat. He says they landed on an island about a mile in diameter, and in one place, he heard the captain state from his observations, that it was 240 feet high. They found several boiling springs, and the old gentleman says that he nearly burned his hand off tryin' to get the temperature of one of them. He remembers that the captain said that it was a volcanic eruption, and that it would soon disappear just as it had come up. They returned to the boat, and on the way back the old gentleman saw a piece of metal, which he picked up and slipped into his pocket for good luck. Sure, it's a fact, if you find a piece of money in the Devil's Garden, it's a sign of good luck, and good luck he had from that day on. Just before I took me first trip to sea, the old gentleman gave me the piece of metal and told me it would always bring me good luck. That's the end of the tale, sirs," he said. "But how in the name of the saints another one just like it got over here is beyond me."

Just at this moment, Sayre, who had been going over the contents of the grave, unfolded a small parchment. This he handed to Crayon, who quickly unwound it. It was about eight inches long and four wide and covered with strange letterings, quite faint but of unmistakable fineness and delicate design. The professor at once subjected it to his pocket glass and with the assistance of the glossary of ancient languages he always carried with him, and assisted by van de Gould, he read the translation as follows:

6 Kan 11 Mulac Elab Molo 8th. To Rulers, peoples and Gods of the Western Arc Welcome we ask for TROAN bearer of our message By the sign of the Gods receive him as known to you by KOKOZ

Ar—Kor scribe.

There was a dead silence when he stopped. The two professors looked at each other and then at the disks.

ROSS broke the silence. "Gentlemen," he said, his voice suppressed with emotion, "I don't know what you think about it, but I am of the opinion that this day we have the indisputable proof that, not only did the eastern civilization establish that of the west, but that Plato was correct; the continent of Atlantis was not a myth; it was a definite fact."

Professor van de Gould hastily went to his portfolio and quickly returned with a map of the Atlantic Ocean. "Mr. Ross," he said, "my brother professor here," indicating Crayon, "and myself have long been subject to criticism and derision for our firm belief in the lost continent and civilization of Atlantis. The discoveries of the moment have firmly established in my mind that it only remains to re-discover this lost continent."

"May I interrupt a moment, Professor?" said Crayon. "Mr. Ross, I have heard that it is your ambition to make some discovery worth while. Allow me to be the first to offer you my time, my service, and, yes, my life, in an endeavor to discover the lost continent."

"Count me in on that, Ross," interrupted van de Gould.

"And me," quickly assented Sayre.

"Don't count me out," cried Dr. Forn, "I'm with you to the death."

"You know me, Al," I smiled, gripping his hand.

Ross's eyes sparkled, as he cried, "Gentlemen, the die is cast; today we organize the Ross Expedition for the discovery of Atlantis; tomorrow we start preparations for our journey."

That evening, after a prolonged discussion, the following was decided: we would give no information to anyone regarding the proposed adventure; Darby Ross would furnish all necessary funds for the equipment of the expedition; that we would charter a steam yacht and fully equip it with everything necessary for deep-sea diving and exploration; that we would make our start at Josephine's Bank, which bank had been discovered in the '70s by the U.S.S. *Dolphin,* and later charted as to soundings by the British ship *Challenger,* whose soundings indicated that bottom had been touched at the depth of 32 fathoms. At this depth it was quite possible to work in diving suits, and under diving bells.

I will not go into the details of the organizing and equipping of the expedition, beyond the fact that an expedition was formed by Darby Ross for the ostensible purpose of collecting data from the ocean's bed, and that we secured the yacht *Jean Valjean* from a French concern, whose crew was selected under the personal direction of Kelly, who made it a point that men well

versed in deep-sea diving, sounding and dredging were included. During the time necessary for the equipping of the vessel, all possible information and data relative to this portion of the sea and to the lost Atlantis, together with the ancient hieroglyphics of the Mediterranean peoples, including Arian, Berber, Phoenician, early Hebrew, as well as those of the ancient Peruvians and Mayas, were carefully gone over, while Professor van de Gould made a hurried trip to London to consult the priceless records of the British Museum to secure additional information.

To Professor Crayon was given the task of providing and equipping the expedition with all of the data and information at his disposal.

Mr. Sayre was given a free hand in the way of electrical equipments, storage batteries, coils, lights, wiring, etc.

To our chemist, Mr. Corot, was entrusted the complete stocking of the yacht with everything necessary in his line for the purpose of testing, analyzing and assorting; also a full supply of flasks, beakers, reagents, test tubes and other paraphernalia.

Dr. Forn, our physician, was instructed to make his department as modern as money and science could provide.

Mr. Ross, as leader of the expedition, secured the latest diving equipments, consisting of suits and diving bells, together with all necessary equipment for undersea exploration; while I was made general utility man and had charge of the storing of the ship with a little bit of everything I could possibly think of that might be called into use.

We worked quickly, and, with unlimited capital at our command, were soon able to have the *Jean Valjean* ready for sailing.

The day before our departure, Mr. Ross and myself went to the Algonquin Trust & Deposit Company, and there, in pursuance of his previous instructions, he signed a trust agreement that provided, in the event of our not returning within a stated length of time, that the monies so entrusted should be spent in a relief expedition; he also deposited certain sealed letters and documents to well-known scientific societies and organizations, as well as to the heads of the departments of several nations.

WE made a speedy trip to France, and as Prof. Corot was well connected with the French Government, he secured from the Minister of Marine the use of Torpedo Boat O-139-B, under the command of Capt. Minde, which was to accompany us under sealed orders. A week later we quitted the shores of France, and one morning, a few days later, we dropped anchor on Josephine Bank, located in Lat. 36 29′ N. Lon. 11 33′ W. with the torpedo boat anchored a short distance away.

Outside of our original party who had made the discovery in the deserts of Arizona, no one else knew the exact purpose of this expedition. Our own men on the *Jean Valjean* were given to understand that we were in search of flora and fauna on the bed of the Atlantic, and to stimulate interest, Mr. Ross had read, both fore and aft, the promise of a reward of $1,000.00 to any man, be he commander or common seaman, who should, during the testings, soundings and divings, make any discoveries of any importance.

As soon as we had cast anchor, preparations were immediately begun for a descent. At the council table it was decided that we work in shifts, and that at all times either Mr. Ross, Professor van de Gould, Professor Crayon, Mr. Corot or myself should be with the divers. It was necessary, therefore, for us to take some lessons in deep-sea diving, and under the able direction of the officers of the torpedo boat, as well as of our own men who were experts in that line, we were soon able to don our diving suits, descend to the bed of the ocean and accustom ourselves to working and exploring under water.

For ten days we searched carefully every square yard that we were able to reach, and found nothing beyond coral and traces of pumice stone and other indications of a volcanic eruption some time in the distant past. Every morning we started out full of hope, and each evening we would gather around the council table dejected and perplexed.

On the eleventh day, Ross made the descent at 9:55 A. M., accompanied by Kelly, Sven Jensen, sailor on the *Jean Valjean,* and Ensign Troya, of the torpedo boat. At 12:22 the signal came to hoist up. When they were released from their diving suits, we immediately perceived on the countenance of Darby Ross that he had made a discovery. We at once went into session, and Ross told us that he had found, at a depth of 39 fathoms, in a direction southwest of the vessel, a mound some 12 feet high and whose diameter he estimated to be about 60 feet. He stated that this was cylindrical in shape, and had the appearance of being a formation not due to Nature, but to the hand of man.

The *Jean Valjean* was immediately moved into position over this mound. The diving bell was brought out, and it was decided that all the members of our immediate party should make a descent.

We had three of the latest designs of diving bells, the largest of which, when lowered into position, would enable several men to work without their diving suits, as the fresh air was pumped directly into the bell. We all know the principles of the diving bell, a bell-shaped vessel, narrowed at the top and wide at the bottom, where it is open; the air excludes the water and being electrically lighted, it facilitates our working upon the cylinder.

In the morning we descended, and with two diving bells suspended directly over the top of the mound, commenced removing the coral and other substance. After penetrating a few inches, we came upon a bronze-like substance, which being cleared, proved to be a reflector about 20 feet square. One side of this was supported by a metal screw and jack, which would permit it to be raised or lowered and also turned from side to side to catch the sun's rays. At one side of the mound we discovered what appeared to be an opening into its interior, and, much to our surprise, we raised this shell in a few moments. It did not seem logical that the task should be so simple.

"THIS is a very remarkable coincidence," said Crayon. "If this cylinder was erected thousands of years ago, how is it possible that this covering should be so easily discovered and raised?"

Sayre, in the meantime, was examining the opening very carefully with a small, powerful electric flashlight. "Gentlemen, this has been used at least within the past fifty years, and possibly twenty."

"What is the matter," interrupted Ross, "with its having been used within the past two years?"

At that remark we all looked up.

"Well, shall we investigate further or stop here?"

"I think, gentlemen," said Ross, "that it would be prudent for us to return to the yacht and equip ourselves, for we cannot tell what will be our fortune, descending into this tube." We regained the surface and spent the rest of the day and evening in preparation for the descent the following morning.

When we descended to the column, as we shall call it, we were equipped as follows:

To Ross were entrusted some instruments, two flasks of water, notebook, flashlight with extra batteries, and pocket telephone and 2,000 feet of wire, which connected with his private telephone on the *Jean Valjean,* and was to be left in charge of the doctor, who was to be our representative while we made the first descent.

Van de Gould had a small but compact glossary of the early Mediterranean people's languages, together with a dictionary of the Phoenician, Maya, early Egyption symbols, together with notebook and ancient words and symbols of all languages for such words as "sun," "god," "day," "light," "king," etc.

Crayon was equipped with flashlight fuses, water, a silk rope 500 feet in length, camera, sealed biscuits, and compressed meats.

Sayre carried a tiny small wireless outfit, together with sundry electric equipment and ten charges of T. N. T. enclosed in water-tight capsules, with wires and fuses for blasting purposes; while I supplied myself with food, water, and an extra supply of compressed oxygen and five helmets, in the event that it became necessary to put them on, for, you will understand, the diving bell protected the opening, and we ascertained the day before that the column was full of pure air. In addition to this, each man took an automatic and 50 rounds of ammunition, while Dr. Forn insisted on giving each man a first-aid kit.

Before donning our helmets and descending to the column, Ross told Kelly, in the hearing of several of the crew, that we were going to work under the diving bell for some time, and that he might ask him to bring us some refreshments that afternoon or evening.

My watch showed 10:55 A. M. when we descended to the column once more. After carefully adjusting the wires of the telephone, the electric light was fixed at an angle to throw its rays directly down the tube, and one by one we clambered through the opening and commenced the descent.

If we had not known where we were, we would have thought that we were descending the steps from the top of the Washington Monument, at our national capital. The marble was of great beauty, and built in remarkable style, while the banisters were artistically carved and Grecian in design. We had gone down about 600 or 700 feet, I suppose, when we noticed a break in the sides of the cylinder, which appeared to be a metal band encircling the interior. We had scarcely gone 10 steps beyond this when suddenly, above our heads, two portions of this band quickly came out from the sides and closed with a short click, throwing us suddenly into darkness. We stopped dead in our tracks, and for several seconds stood in expectation. Sayre then produced his flashlight, and it showed each one of us nervously grasping his automatic. But there was not a sound from below. Above appeared a roof similar to bronze that covered the entire space over our heads. We quickly went up and tapped it, but it gave no sound. Our telephone wire had been snapped when the jaws of this gate had closed about us.

"Well, gentlemen, here we are," said Ross, philosophically. "What are we going to do about it?"

"I am going to sit down and think a minute," said van de Gould, pulling out his water flask and taking a drink.

Sayre was busily working with his wireless, and in a few minutes was trying to get the Doctor on the *Jean Valjean.* We watched him anxiously for several moments. "Can't get them," he said. "There must be something in that confounded covering or in the atmosphere that kills the ether vibrations. I guess we're in for it gentlemen," he said, after a few more minutes of vain endeavor to establish communications.

"All right, then let's go ahead," said Ross. "Sayre, you're the leader of this outfit as long as we're in the dark, so you lead the way."

So Sayre, with two powerful flashlights, led the way, step by step, down the column. I remember that I counted the steps mechanically as we descended, and it seemed that we should never reach the bottom. I had counted over 1,600, when suddenly the column was lighted up with a pale greenish light, which gradually grew brighter until the flashlights were not needed. At the 1710th step, we reached bottom, where, much to our surprise, we found an open door, and two men waiting to receive us. Sayre, who was leading, naturally put himself on the defensive and raised his automatic. One of the strangers, pointing to the automatic, waved his hand back and forth, as if to say, "Put it away." In the greenish light we observed them closely. They appeared to be men of about 40 years of age, clean shaven, light in complexion, with high foreheads, prominent noses and wide cheek bones. They were dressed in tunics, apparently of linen, and golden in color, which reached to their knees. The calves of their legs were bare, and upon their feet they wore sandals. Around his neck, each wore a golden band, in the center of which appeared an emblem of silver.

AS we stood gazing at each other for a moment, one of the strangers, apparently the leader, stepped to one side, and bowing, with a wave of his hand invited us to come out. We did so, but now at a whispered word from Ross, Professor van de Gould took the lead. Our guides conducted us through a marvel-

ously beautiful, abandoned temple. Huge columns arose on all sides of us, while broken pillars and vast slabs of marble blocked many a court. Wonderful fountains, without water, appeared on either side of us, and for some time we walked through the grandeur of what appeared to be an ancient pantheon. We proceeded about two miles, always descending, and along a path some eight or ten feet wide that had an appearance of being traveled for centuries. Overhead, at a height of from 50 to 200 feet, was the ocean-bed roof, while all around us, seemingly coming from no particular spot, was the soft greenish light. We continued in silence until suddenly we came to the opening of what appeared to be a pit. One of our guides opened a door, and we observed a small car, with a seating capacity of about twelve people. This car appeared to be a cicular conduit, and we were invited to be seated. We complied, our guides taking their station, one in front and one behind. The door closed, and we felt a small shock, as of starting. Sayre told me afterwards that he counted fourteen seconds, when we experienced another slight shock. Then one of our guides opened another door and the place was once more flooded with light. We stepped out upon a platform. Sayre stopped a moment to examine the cylinder and carriage, but before he could make much of an examination, one of our guides motioned him to go on. "Compressed air tube," he whispered, as he came up to me.

We ascended a small stairway, and there before our view was the most magnificent spectacle it has ever been my fortune to behold. Words are inadequate to express the marvelous beauty unfolded before our gaze, but I will try to give you the view. Imagine, if you please, a city of white, blue, gold and brown marble, with wonderful towers, minarets and spires, each one throwing off most brilliant colors under a soft greenish light that pervaded every place. Above, at a height of about 1,000 feet, was the earth's crust. Behind us was a solid wall, extending hundreds of feet above us, till it met the crust. To our right, stretching away in the distance, we observed canals and rivers, while to our left, the view was obstructed by reason of a magnificent building, with marble columns at least 300 feet high, and extending fully a mile across. The leading guide waved his hand across this splendor, and said, "Cauphul."

"Cauphul! gasped van de Gould, "The Royal City!"

I cannot give the pronunciation of the guide, but the professor imitated the pronunciation.

As we stood gazing over this wondrous scene, Ross touched van de Gould's arm, and, pointing to the marvelous building at our left, said, "Is that the Xeoqua or Incula?"

The Professor, pronouncing them differently, turned to our guide, and repeated the question, pointing to the building. "Xeoqua? Incula?" as if asking a question.

A look of astonishment came upon our guide's face as he immediately repeated, "Xeoqua," and grasped the Professor by the hand.

Turning to us, who were much puzzled by this conversation, the Professor said, "That, gentlemen, is Xeoqua, the College of Scientists of Atlantis, the most celebrated university the world has ever known, and within whose archives I soon hope to have the pleasure of examining records dating back beyond the dreams of mankind."

One of our guides at this moment stepped a few paces to the left, and was joined by several men. These men were more severely dressed than our guides. There were five of them, one dressed in white, one in black, one in purple, one in blue, and one in silver, while around the neck of each one was a band similar to those worn by our guides, but theirs were studded with precious stones. Our other guide went over to them, and carried on a low-toned conversation with them. I heard the words, "Incula," "Cauphul" and "Xeoqua," and noticed the pleasure and surprise that lit up their faces, as he undoubtedly related to them his report of the conduct of Professor van de Gould. They now came over to us, and politely but firmly began to examine our equipment and clothing.

"Offer no resistance," cried van de Gould. "Our lives hinge on this moment. Do as you are requested."

EACH one of us in turn was divested of his equipment and apparel, down to his underwear. We were then given gray tunics to slip on, and each was handed a pair of sandals. We were allowed to individually remove our shoes and hose, and found the sandals most comfortable. The temperature was very even, and we experienced no discomforts along that line.

We were led down a winding stairs into a large chamber, where, as if expecting our arrival, was spread a meal. We were motioned to take our seats and eat. The food consisted of milk, and a species of fish baked with a most wonderful sauce. In lieu of bread, we had round cakes, which tasted like cornmeal. We also had two vegetables, one resembling stewed celery, but of a very delicate composition and marvelous taste and we were served a beverage, which tasted like a Rhenish wine. We were waited upon by two men, short in stature, and of a darker hue than those we had met. They were dressed in tan colored tunics and appeared to be of a lower order.

After we had finished our meal, one of our former guides returned and beckoned to us to accompany him. We followed him through several corridors, and were ushered into a room that was literally filled with the most marvelous statuary it has ever been my pleasure to behold, though I have traveled all over the world. After leading us through this chamber for about 50 or 60 feet, we made a sudden turn to the right, where before us was a man sitting behind a bronze table, upon which was burning a white candle, and before whom was spread, much to our astonishment and surprise, the notebooks, dictionary, and glossary of Professor van de Gould. He was dressed in a white and gold tunic, and upon his head there appeared a golden emblem, in the center of which, directly above his forehead, was the mystic sign found upon the reverse sides of the discs, except that a great diamond blazed in the center.

After we were presented to him, our guide withdrew and left us with this personage. Imagine our surprise when he calmly addressed us in English, as follows:—

"I believe I have the pleasure of addressing Professor van de Gould, Professor Crayon, Mr. Darby Ross, Mr. Sayre and Mr. Gregden. You, gentlemen, are doubtless surprised that I address you in English. Though for the time being, your curiosity cannot be satisfied, permit me to say this: We have been expecting you for a long time. The only inexplicable thing, to our minds is the fact that you have not come before. Permit me to say also, gentlemen, that it appears from the evidence at hand," indicating the Professor's books before him, and also glancing to the right, where we observed the rest of our equipment and apparel lay in array, "that you came prepared and expecting to find our domain and did not, by mere chance or accident, stumble upon it. For if you gentlemen had come by accident, you would never have penetrated the Pyramid to the Sun." He lifted his forefinger above his head and continued, "you would have perished, and none would have known how you died." Rising, he said, "You can remain here with us, and we shall be pleased to entertain you, upon the following conditions: First, that you immediately, under the direction of proper tutelage, learn our language: second, that you make no endeavors to go beyond certain bounds and limits which will be prescribed for you. If you gentlemen will accept these conditions, which, I am sure are fair, and if you prove willing and apt pupils, you shall each and every one of you be more than repaid in what we have to show you. You will now, gentlemen, be re-conducted to the outer portals, and there will find the proper instructors, who will provide for your daily needs and will teach you according to my directions. I will ask, for the time being, that Professor van de Gould be your spokesman, and if you are willing to accept my proposition, I will be pleased to hear from the Professor."

The Professor asked for a moment of consultation with us, which was granted, and we readily accepted the conditions.

It is hard to describe our feelings, and as events of such momentous importance were occurring constantly, to me writing this now, it appears as a wonderful dream. At any rate, the Professor talking for us, consented to the conditions and we were re-conducted to the outer portals, from which we were taken to the Inn of the Idosa, a branch of the College Numea, which, in turn, was the Department of Elementary Learning in the University of Xeoqua.

IT will be practically impossible, as my readers must know, to give at this time a full and detailed report of everything I saw and learned during my sojourn with the Atlantians. I will, however, briefly mention from time to time, though not in any order of events, the wonderful and marvelous conditions, arts and sciences, which brought forcibly to our attention, the fact that we who dwell upon the earth, have only scratched the outer surface in the many arts and sciences that await inventive genius to bring them forth.

At the Inn of the Idosa we were each given a separate room, and also assigned an instructor whose duty it was to teach us the Atlantian language. The suite of rooms occupied by us at the Inn of the Idosa was opening upon an enclosed court, in the center of which were baths. These baths were of three different depths and temperatures. The art of bathing, which the Pompeians had developed extensively, was here carried out to great lengths. In fact, we soon learned that bathing was one of the tenets of their religion.

Professor van de Gould had been appointed our chief, and to him was communicated our mode of life during our term of study. Briefly, it was as follows: we arose at 6:30 A. M., went to the baths until 7.15, breakfasted at 8.30. We commenced our studies at 9.00 o'clock in the morning, pursued them until noon, at which time we had luncheon together. From 1.00 p. m. to 2.00 was given to rest. From 2.00 until 3.00 we were at the baths, where I had the most delightful massage I had ever experienced. From 3.00 until 5.00 we were at our studies again. From 5.00 until 6.00 was our loafing hour, which we spent together in going over our work and discussing plans for the future. Dinner was served at 6.30. From 7.30 until 9.00 we again spent in study. Baths again at 10.30 and bed at 11.00. I use the terms "day" and "night" for the reason that, though the city was lighted artificially, we had dusk, darkness and dawn artificially also, the same being produced by the wonderful lighting effects employed.

We were given to understand that, until we had sufficient knowledge of the language to enable us to carry on a conversation and appreciate what we heard and read, we would not be allowed to make any further investigations, so you can appreciate how diligently we applied ourselves to the task. In learning the language, Professor van de Gould was of great assistance to us, and under the tutelage of the instructors and his advice, in less than three weeks we were able to understand conversation, and to read and interpret the writings a little, at least. Briefly, the Atlantian language was a combination of the Early Phoenician, Old Hebrew and Maya. Their alphabet consisted of twenty-five letters, there being no "w." They also had a letter pronounced "gay," which was used a great deal instead of "g" the letter, "gay" being used for the "gh" sound. For example, the word "gold," instead of "g-o-l-d," they spelled it "gh (gay) -o-l-d." In the writings, they used a combination of the Archaic Phoenician and Old Greek, but these were simplified to such an extent that a single character would often mean a sentence, as for example, the expression, "Is this yours?" when spoken "Is this yours?" would simply be the character "Yours?" when written.

Our life was very pleasant and wonderfully interesting, for all of us were naturally on the *qui vive* as to what was in store for us to learn. I remember, however, that Sayre, during our hour of mutual intercourse one evening, with a troubled look on his face, said: "I wonder!"

"Wonder what?" queried Professor van de Gould. "I wonder how we're going to get back."

"Back?" cried the Professor, starting up. "Don't let me hear anyone say anything about going back. Why, we're on the threshold of such astounding discoveries that a man would be a fool to want to go back now. What say you, gentlemen?" he questioned, looking at us. We all heartily assented that it was our firm desire now to carry on and see the thing through. Ross, especially, was enthusiastic about going ahead with our investigations.

ONE morning, about three weeks later, we were informed that we had reached that degree of proficiency that would enable us to take our places with the citizens. Up to this time, we had lived strictly by ourselves, with the exception of our instructors, who, we learned, were assistant professors from the Universities of Xeoqua and Incula—Incula being the university or college of the priesthood, with many departments and ramifications. On the morning that we were informed of our eligibility to become residents, we were introduced to several gentlemen, clad in purple and white, and each bearing around his right wrist a golden band, set with a beautiful pearl, which gentlemen took us through the Royal City of Cauphul. After we left our dwelling, we were conducted down an avenue about one-third of a mile. This avenue was one of ten, each starting from a point one mile from the center and meeting in the center of the city in a vast enclosed circular temple. This was the holy temple dedicated to Cleito and Poseidon, (Neptune) which remained inaccessible, and was surrounded by an enclosure of gold. This was the spot in which the Atlantians were originally born—the race of the ten princes—and here annually they brought the fruits of the earth in their seasons, from all ten provinces, each province having an avenue of its own, and performed a sacrifice to each of them. Here was Poseidon's temple, a stadium (607 feet) in length, half a stadium in width, and one-fifth stadium in height. All the outside of this temple, with the exception of the pinnacles, was covered with silver, the pinnacles with gold. The interior of Poseidon's temple was of ivory, while the over-coverings were of a metal long since lost to us, orichalcum. In the temple were statues of gold, with one of the god himself standing in a chariot, with six horses, and of such a size that he touched the roof of the building with his head. Around him were one hundred Nereids riding on dolphins; and around the temple on the outside were statues in gold, ivory and orichalcum of ten kings and their wives, which ten kings were said to be the founders of Atlantis. Each avenue was about 150 feet in width, and down the center of each was a canal some 25 feet in width, the waters of which met in a common pool under the temple of Poseidon. Ornamental trees resembling Oregon pine, and about 20 feet high, lined each avenue, while around the temple were many trees that we did not recognize. However, we found two friends among them, the orange and the magnolia. We spent several hours within the temple of Poseidon, but we were naturally refused permission to enter the holy temple of Cleito and Poseidon, as no one was allowed into this Holy of Holies except the priests, who entered once a year, or at the coronation of a new prince.

As we came out from the outer temple, we were introduced to the keeper, whose name was Gauch, of the temple archives. They used last names only. He was a most pre-possessing looking man of about 60, with keen steel-blue eyes and silvered hair that hung around his neck. His tunic was pure white, slashed across the left breast with gold. He was at least 6 feet 3 inches in height, and a splendid specimen. He informed us that he had been commissioned by the fourth prince, whose day it was to rule, to invite us for the noon meal, and that during this meal we would be given a brief history of Atlantis. He then conducted us through several marvelously columned corridors to the Prince's apartments. During the walk he told us that Atlantis was ruled by ten princes, each prince ruling a day. When the ten days have elapsed, each prince having ruled one day, the eleventh day was the King's day, or the day of Helios, (Sun) and devoted to the worship of the sun, which day corresponded to our Sunday. Time was divided into a year of 300 days, and each ten years was combined into a circle, and five circles, or 50 years, was called a bundle. This, we were afterwards told by Professor van de Gould, differed from the ancient custom of the Mayas, which combined every 13 years into a circle, and every 52 years into a bundle, at which time they started in a new cycle.

When we reached the Prince's apartments, we were conducted into the banquet room with little ceremony, as the princes were very democratic and went freely among their people. However, we were careful to obey Gauch's instructions, and when the Prince entered the room, we each raised our forefinger to the top of our head—their mark of salutation. We did not learn the Prince's name; he was simply introduced as the Prince of the day. The Prince seated himself first, and we, including Gauch, in turn seated ourselves around him. After an invocation to the sun, we were served with the following luncheon: A clear soup of delicious taste; a meat that resembled rabbit, combined with lobster, well-seasoned, which was served upon a sweet-tasting sea grass, reposing in a beautifully colored shell; Delicate brown cakes, resembling cookies, and light-colored wine. Seated at the table, the Prince gave us a brief history of Atlantis, which I will condense, as it is my intention, if ever I return from the Relief Expedition, to devote several volumes, each one dealing with our discoveries in proper order.

ACCORDING to their history, Atlantis was founded by god Atlas, about 30,000 years, B. C. The Atlantians waxed strong and great in the arts and sciences. Their commerce extended over the whole known world. When in their glory, without warning, they were suddenly effaced from history. They were submerged in a series of earthquakes and cataclysms that lasted two days and three nights, 9604 years B. C., during which time 64,000,000 people were killed. Many escaped, however, by seeking refuge in the vast catacombs that had been used for hundreds of centuries far beneath the surface. In these catacombs, some

90,000 men, women and children escaped death; where, after the inundation, they started their lives over again beneath the surface of the waves. Air and light was received from a number of extinct volcanos. And the Atlantians at the inundation were well versed in the art of reflectors. By the use of these reflectors, similar to the one we had discovered upon the column, which, we learned, were composed of the metal orichalcum, they had no difficulty in flooding the vast subterranean caverns with light. In time, as these volcanos were submerged, a new method of securing air had to be devised. Their scientists invented a process which consisted of sifting the oxygen out of the ocean water. This, in turn, as their science advanced, was succeeded by piercing the crust between them and the ocean and running to the surface of the water huge tubes, pliable, and made of hemp, through which the fresh air was drawn down into vast reservoirs and then distributed. During the past centuries, he informed us, they had made wonderful strides, and were now able, by the use of heliography, to collect in huge reservoirs, called solariums, not only the heat from the sun, but its light as well. Aided further by marvelous electrical apparatus, they were able to produce a most wonderful lighting effect. Their kingdom at the present time extended until the uttermost parts were under the Andes, in South America. Not all of this, however, was open for space, light and air, but whenever they had found a vast underground cavern, they had immediately proceeded to develop it. We were informed that the population at this time did not exceed 1,000,000, as the necessity of keeping down their inhabitants to conform to their present living spaces made it imperative that they keep down the birth rate.

Questions asked by us, which the Prince did not care to answer, were answered simply by the one word, "Wait."

Gauch was asked by Professor Crayon if he would tell us his age. "Certainly, Professor. I suppose you desire it in the length of years as you compute time." The Professor bowed. "I am 142 years old."

"Impossible," cried van de Gould, rising from his seat. But quickly appreciating his position, he re-seated himself, stating, "I beg your pardon, sir, but it seems incredible."

"Yes," smiled Gauch, "it would seem incredible to you, but remember that we have found a way to prolong life."

"And that is?" questioned Ross.

"By simply taking care of our bodies," continued Gauch, with a smile. "I shall have the pleasure, gentlemen, of introducing to you one of our oldest inhabitants, a man who was a youth at the time your George Washington was born. He is an exception, of course, as he is the third oldest man in the domain of Atlantis, but many of our professors and priests are over 160 years of age."

After a discussion of this point, the Prince stated that he, personally, would be pleased to conduct us to the great temples of learning, one of which we had seen upon our first arrival. As we started out, Sayre, seemingly much embarrassed, asked the Prince: "Pardon me, Your Highness, but I am quite interested to know, if I may ask the question, how you travel from one end of your domain to the other, if all of it is not open? Is the method similar to that which was employed to bring us from the Column of the Sun to your city?"

"It is," replied the Prince. "We have constructed air tubes all over our domain. These work with such precision and accuracy that it is possible to make many miles per second in them."

"What impressed me, Your Highness," continued Sayre, "is that, while we were only thirteen or fourteen seconds in the cylinder coming here, I felt that we traveled a number of miles."

"It is 114 miles from the Temple of the Sun to this city," quietly supplemented Gauch, "but come, gentlemen, the Prince is waiting," and we started up the avenue of the Ninth Prince to the College of Xeoqua.

AS we leisurely walked down the avenue, Professor van de Gould recalled to the Prince's attention a part of the conversation at luncheon, and said:

"You stated, I believe, Prince, that if we had stumbled accidentally upon the Column to the Sun and thus found our way to your domains, that we would not have been received in as friendly a way as we were. May I ask why?"

"Yes," replied the Prince, and his face grew dark. "We, of Atlantis, are a proud people. We are direct lineal descendants of the gods. We can trace in unbroken lineage our descent for hundreds of centuries, and of all the peoples of this and other planets, we are the most learned, and yet," his lip curled scornfully, "we understand that you surface people claim great strides in science and discoveries. That being the case, pray tell me why have you let century after century pass without making at least an attempt to find us?"

"Pardon me, Prince," quietly interrupted Ross, "but if I recall correctly, an attempt was made in the tenth century."

"Yes, we know that," replied the Prince, "but it seems to us that, with a people claiming the civilization that you do, more than one expedition every thousand years would have been undertaken."

"I am sure, Prince," spoke Crayon, "that many of us would have undertaken this expedition long ago if we had known where to make the start."

"You are wrong there, Professor," replied the Prince. "Since 1876 you have known that a portion of the ocean's bed was accessible to man in diving suits for explorations. Why, then, this lapse of many years? And I dare say," he continued, "that your expedition was brought about by chance, rather than by scientific study. Am I not right?" he continued, turning to me.

I humbly admitted that it was the truth and, at a nod from Professor van de Gould, related to him the finding of the disks, also telling him that many of our scientific men firmly believe that the continent of Atlantis did exist, though where they do not know.

We walked silently for a few moments, when our companion, the electrician, asked Gauch, "Do you not

expect that our friends from the *Jean Valjean* and the government boat will discover the Column of the Sun and descend as we did?"

"No," he replied, "for the simple reason that when the bronze gates were closed over your heads, the whole top of the column was destroyed by an explosion of cynite, which doubtless shook the water under your vessel somewhat. They believe you perished in a submarine earthquake."

At this startling statement, Ross suddenly stopped. "Do you mean that you wilfully destroyed the boats?" he asked.

"No, your vessels are uninjured. I might further say," he continued, smiling, "that they are now in France and the report has been published throughout the civilized world that you gentlemen perished in a submarine earthquake, and scientific journals have devoted much space and eulogy in your behalf."

"Is it not a fact," queried Sayre, "that the Temple to the Sun has been used for ascent or descent within the past few years?"

"Yes" the Prince replied, "such is the fact.

"A little over fifty years ago, while some of our scientists were making certain tests, they used the Temple of the Sun to gain the surface of the water, and while engaged in making their experiments, they experienced a break in their line of communication. While they were endeavoring to repair the same, a three-masted sailing barque hove in sight and bore down upon them. It stopped about two cables length away, and the captain's gig came over to the float upon which our men were working, believing that they had found a shipwrecked crew. They were much surprised when they found such was not the case, and the captain, who was in the gig, immediately proclaimed them as the lost Atlantians. We did not care to have this report become known in the upper world, and as the repairs by this time were completed, by an artifice, all of the crew and passengers of the sailing vessel were induced to come aboard the float, and later were conveyed to this city."

"Did you ascertain the name of the vessel?" asked Ross.

"Yes," he replied, "it was the *Marie Celeste*."

"And the name of her captain was S. B. Briggs," stated Sayre, in an agitated voice.

"The same," replied Gauch, bowing.

Thus, after a lapse of some forty-two years, the greatest marine mystery was cleared up.

AS many of the readers of this narrative are not familiar with the facts above stated, I will give a brief resume of the same.

The three-masted barque, *Marie Celeste,* B. S. Briggs, Captain, sailed from an American port about the middle of 1873, with a cargo of alcohol, bound for Genoa, Italy. On board the *Marie Celeste* were the Captain's wife and small child, two mates and the crew of seamen. On the 24th of November, the ship *Dei Gratia* found the *Marie Celeste* idly floating near the Azores, and, noticing her peculiar movements, boarded her. Everything on shipboard was found in order. There was no appearance or indication of a disturbance of any kind. The remains of a meal was found upon the cabin table, and some baby clothes were found with a portable sewing machine in the Captain's room. The Captain's gig was found hoisted in place, but the tarpaulin covering it had been removed, and the indications were that it had been lately used.

"May I ask if any other persons have been received in Atlantis?" questioned van de Gould.

"Yes," replied Gauch, "we were involved in a problem of chemistry about thirty years ago, and through a secret arrangement, we received through the Column of the Sun, Johann Salvator, son of Leopold II, and a nephew to the Queen of Spain."

"That explains another mystery," I cried, for the whole civilized world for years has wondered and speculated upon the strange disappearance of the Archduke, sometimes known as John Orth, from the *Margherita.*

"And from these," said Ross, "you doubtlessly made a study of our languages."

"Oh, we had a working knowledge of your languages for centuries, but when the Council of Ninety met in next session, it was deemed advisable to have certain of us learn the leading languages of you surface people so that, should we again receive a visit from any of you, we would be able to communicate with you."

"And are these people still living among you?" said Sayre.

"That question I am not at liberty to answer," replied Gauch, "and you will please discontinue the subject."

When we reached the College of Xeoqua, we were received with quiet dignity and respect by a number of the professors and scientists. We were conducted into a large antechamber, and after seating ourselves, the Prince made an address, in which he stated that he desired the professors and scientists of the college to give us a general idea of the work that had been accomplished and was being done now by them in their different departments, and expressed the wish that we might find it interesting and profitable. He also stated that he would be pleased to see us at his palace on the next day of the sun, which was then five days distant, at which time he would provide entertainment for us. At the conclusion of his remarks, and at a sign from Gauch, we all arose, gave him the salute, and he withdrew.

Gauch then told us that he had arranged for us to attend the short school of semi-lectures, at which we would be briefly told of the arts and sciences, and be given a general outline of the laws, history, religion and departments of commerce, so that we could appreciate better what we saw and heard. He then introduced us to Archa, the third assistant Professor of Archaeology of the University, and withdrew.

Archa was a very energetic, brisk individual, a man of about 45 or 50, with roving, jet black eyes, and a mass of raven hair that fell down to his shoulders, and through which he was continually running his hands. "Pray be seated, gentlemen," he said, "I am indeed fortunate to have been chosen for this office, and it

affords me great pleasure to welcome you, on behalf of the College of Xeoqua. I shall make my remarks brief, but to the point, I trust.

"THE College of Xeoqua, or University of Scientists, was founded about 22,000 years ago. Though we lost many of our priceless instruments and parchments during our almost total destruction, yet, fortunately, we were able to re-discover many of them, and have now a fair working laboratory. Our records are preserved by burning into tablets of orichalcum with electric torches what we desire to preserve. The originals of these are kept in impregnable vaults, while copies are reproduced upon parchment for everyday use.

"Students are admitted to this College at the age of 16, upon the proper recommendation from their school principals, and after they have passed a rudimentary examination by the under-professors. Their tuition is paid by the State, and they follow our school of instruction here until they reach the age of 26, at which time, if they have shown marked aptitude along any particular line, they are assigned to that department. If, however, they desire to leave the College, they may do so at any time. If they stay, however, they hardly ever leave until called by death. We have at the present time about 3,700 students between the ages of 16 and 26, and about 1,500 from 26 and upward.

"This College is divided into four departments, the Numea, the Terna, the Idosa and the Corosa, and while I am Under-Professor of Archaeology, yet it is the Prince's instructions that I give you a general outline of our everyday existence. The colors that we wear all have a meaning referring to the planets."

"What!" exclaimed Professor van de Gould. "Do you mean to say that you are in communication with the different planets?"

"Yes," calmly replied Archa.

"How?" cried Ross.

"Patience, gentlemen, patience," he replied, as our two doughty professors jumped to their feet, quivering with excitement. "You will learn all this in due time, but for the moment I will simply state that it is through the sixth, ninth and eleventh dimensions."

"Sixth, ninth and eleventh dimensions?" cried Crayon. "Good heavens, man, we have been puzzling our brains for centuries to find the fourth."

"I am aware of that fact, also," calmly replied Archa. "But here we have a positive working knowledge up to the seventeenth dimension."

"Which is?" cried Ross.

"The control of time and space," answered Archa.

"May I ask a question?" I said.

"Certainly."

"I am an humble student of the mysteries of the fourth dimension. Could you tell us something about it briefly?"

"I would be very pleased to, but I am afraid that your minds at the present time cannot comprehend it. However, I will give you a rough outline.

"Of the three dimensions you are well aware. Of the fourth, you have a vague knowledge, by reason of the fact that you know of time, space and numerals. Let us take for a moment the question of numerals. Your count, I believe, runs as follows: Units, tens, hundreds, thousands, and then, in proper order, millions, billions, trillions, quadrillions, quintillions, sextillions, septillions, octrillions, nonillions, decillions. Beyond decillions, I do not think you compute. You represent, in short form, a decillion by the figures 10^{33} However, you cannot comprehend these figures. You are also aware that Time has existed in the past, but how far back you cannot compute. You also believe that time will exist, but for how long you cannot estimate. You also know that space exists, but what its realms and boundaries are, you know not. By the use and practice of the fourth dimension, we are able to reach back into the past centuries and extend our calculations into future centuries upon the slender but indisputable line of numbers.

"By the aid of this dimension and a system of wireless photography, we are able to photograph the planets in any desired distance. However, up to this time we have not been able to convey these directly to our laboratories, but while suspended above the earth, they are re-transferred through lenses, and by the aid of electricity, so that our telescopes are able to receive the impression. These, then are conveyed from our observatories by compressed air chutes directly here."

"May I ask," inquired Sayre, "where your observatories are located?"

"Yes," replied our informer, "they are concealed within three extinct volcanos in the Andes Mountains."

It might be of interest to you gentlemen to know that, to acquire a working knowledge of the figure Zaī, it took 110 years of a score of scientists, working on an average of 10 hours a day, to arrive at this calculation, and so difficult is the maze through which the trained mind has to wend its way in arriving at these calculations, that only those of us who are endowed with super-brains can stand the strain. We now have a score of professors working upon the calculations of Sa. The calculation of Mach was discovered about 3,000 years ago, and, for a long time, sufficed. To give you gentlemen a slight idea of the enormity of the calculation Ch, which comes between Mach and Zal, imagine, if you can, your highest numeral, decillion. This you will divide into four parts. Now, if you please, multiply each part by one decillion a decillion times, then mathematically join these four parts together in the form of a square. In this square you will place a sum equal to a decillion times a decillion times a decillion, and repeat this multiplication until you have arrived at a number equal to one decillion multiplied by a decillion to the *nth* power. You will then have an atom upon which you must build the superstructure that in slight comparison is as large as the smallest atom known to you, decreased by the largest figure known to you, and compared with the farthest distant star. This, gentlemen, will give you a slight idea as to our calculations. As you are doubtless aware, our earth was made only yesterday, and will exist only until tomorrow."

"May I ask," inquired van de Gould, "what you take as the basis of your calculations?"

"Yes, Professor, our calculations are based upon what you call Nature. When I was attending the University here, in my 24th year, Gondola, the celebrated chemist, gave us this thought, which I will give to you: 'Nature has no bankruptcy laws. She is inexorable in her exactions. All debts must be paid in the coin of Nature's realm, the coin called energy. It never varies; it never expands; it is never hoarded and never hidden; it never goes out of circulation. Heat, the original fountain of all form of energy is its father. The endless transformations never invade the limbo of annihilation."

WITH hardly a moment's hesitation, Archa started an entirely new line of instruction. "You will note," he continued, "the costumes worn by our citizens. They each represent some lineal descent or office. I do not think you have had the pleasure as yet of meeting any of our females, have you?" he queried. "Note, then, and remember. Maidens to the age of 16 years wear around their left ankle a white woolen bracelet, denoting innocence. Maidens from 16 to 21 wear a red woolen garter just below the knee and above the calf; while those over 21 wear a blue one above their knee. If they are married, around the upper edge of the blue is a small white band. The red denotes love; the blue, chastity and the white fidelity.

"The different marks worn by our citizens I will not explain to you now for the reason that our two colleges, the Incula and Xeoqua have each several secret organizations which carry with them certain marks of recognition and distinction. You will, therefore, gentlemen, obey this positive injunction, never to question or ask the meaning of any device worn by anyone you meet. If it is thought best and proper, it will be explained to you later.

"Now gentlemen, just a word as to our founders. Atlas was the founder of Atlantis. Neith is the god without descent. Anta is the Goddess of War. Amset is the god of the Deep or Lower Regions. If you have not already done so, you will see certain inhabitants of our domains darker in hue and smaller in stature than those you have seen. These are the people of the deep, or the Deep Folk, descendants of long-banished tribes, who eke out their existence in caverns and abysses far beneath us, and who once in a while wage a ferocious, terrific, but as yet unsuccessful, warfare against us of the upper strata. Athena (Minerva) is the guardian of the olive, and is the Goddess of the Fruits. Eos (the Dawn) is the Goddess of Dawn and of Light, while Fauna is the Goddess of the Chase or of the Animals. We have few animals in Atlantis—only the smaller ones, such as would correspond to your rabbit, fox and the small deer. I give you this briefly, so that you gentlemen will recognize the name and what it stands for when you see it, also to warn you to be very careful and considerate of the numerous temples, altars and shrines erected and dedicated to these gods and goddesses. I will frankly state to you, in confidence, that we of the two colleges long ago abandoned the supposition that we were descendants from the gods. We do, however, recognize a Supreme Deity, and one that follows closely along your ideas, but this fact is not known to the general citizenry, because, for political and other reasons, they are taught to believe that the reigning princes are descendants of the gods. I am also instructed to advise you that there is one prince among the ten that we have now over us, that does not welcome you to our realm. You will meet him later. He is the Prince of the Ninth Day, and his name is Maut. Do not cross him in any way, as we are afraid that his mind is affected, though he still rules the Ninth Day. However, I do not think he can do you any harm or injury, because at a meeting of the princes, held after your arrival, his was the only protesting voice against welcoming you to our domains.

"But come let us take a walk through the college." We proceeded with him.

As I have stated before, the building was of marble and of huge proportions. Its width, I afterwards learned, was about 1,600 feet. It was abundantly lighted by huge windows and openings at the top, and also was fully equipped with lights and reflectors of every description. Along the side of the building there was operated a moving sidewalk. At the invitation of Archa, we stepped upon the same, and he conducted us first to the Medical Laboratory.

"Poor old Korn would have given his right eye to be with us now," whispered Sayre to me, as we stepped from the moving platform into the opening of the most marvelous and stupendous laboratory I have ever seen.

EXTENDING for hundreds of feet were numbers of energetic people, both men and women, working with coils, test tubes, burners, electrical apparatus, light shades, heating devices, balances, microscopes, retorts, and many other instruments unknown to us. The height of this room was 60 feet, and Archa informed us that there were four floors to this department. "Of course," he said, in his brisk voice, "we cannot show you everything at this time, but here are a few of our semi-modern instruments, that I do not think you are acquainted with."

We walked over to a large table, and he called one of the men working there to explain to us an odd-looking instrument similar to a piece of hose, about as large as your little finger.

"Nami, tell our visitors the meaning of this tube."

I cannot give you the medical terms used, nor can I recall the exact wording of his explanation, but, in brief, it was this:

Whenever an inhabitant was afflicted with lung or stomach trouble, this tube was inserted down the throat, and so wonderful and compact was this instrument that, by means of an electric spark, a moving picture was taken of the workings of the heart, lungs and stomach. The tube was then withdrawn, the film was developed and enlarged, so that an exact reproduction of the organs performing their functions could be thoroughly diagnosed by the physicians. This invention had been

made possible by the discovery and use of a substance similar to glass, yet pliable like rubber.

Nami then took us a few paces further on, and brought us into a chamber that contained a couch, upon which was stretched a semi-nude body of a man. A few feet distant was an animal, similar to our gray squirrel. The man was sleeping peacefully, while the animal was evidently in some pain, as was evidenced by its jerky motions and a stifled squeal from time to time. Attached to the right limb of the man was an electric battery, and a wire reached over to the animal and was attached to one of its legs, upon which was a similar battery.

"You now observe," stated Nami, "one of our unique and very satisfactory operations. This man," pointing to the patient, "was afflicted with rheumatism, and this instrument," indicating the wire and battery, and also pointing to a strange looking instrument standing near-by and which was connected with the battery both upon the man and animal, "is used to draw the strain unduly placed upon the patient's muscles, and transfer it to that of the animal, causing the pain to leave the patient and enter the animal through this wire." I learned later that it was known as a transfuser.

Many other marvelous and wonderful instruments were shown to us in this department.

Nami also informed us that they put great stress upon electrical internal baths, as well as the use of light, air and certain herbs which were produced and grown for that purpose in the Xeoqua Experimental Grounds, located about 1,000 miles distant.

We then visited the Electrical Department, and here Sayre was in his glory. I will not go into detail at this time, but mention only a few of the inventions and arts we saw here. About the most remarkable, I think was that of photography. The Atlantians had developed this branch of light to such an extent as seemed almost inconceivable. For instance, if a home mansion or temple desired a wonderful marine view, the following was the procedure: Upon the wall where the view was desired was placed something that corresponds to our negative. The room was then darkened, and through an instrument upon this was flashed a picture of the ocean for several moments. The room was then darkened, and an application made to the subject. A thin coating was then removed, and before your view was presented a picture, in natural colors, of the ocean in motion, the waves rolling in and the spray dashing, with the shimmer of the light making momentarily rainbows of the most exquisite tints; sunrise, full mid-day sun, sunset or cloud-effects could be had at will by the operation of light-shades.

THE wireless telephone was perfected to such a degree that every citizen who so desired, could carry with him a small tube three inches long and one inch in diameter, and knowing previously the pressure needed to reach the stratum that would put him in communication with the party he desired, by simply pressing upon a small dial attached to this instrument until the indicator reached the number desired, he was instantly put into communication with his party, and, holding it a few inches from his face, could send out and receive communications as easily as if the party were present.

Ross was very much interested in their electric cookers, for I have neglected to state that all of the cooking and heating was done by electricity, generated from one plant and conducted by wireless throughout the city.

Sayre was much impressed with a strange-looking instrument that resembled two brass rods standing about ten feet apart, from which extended horizontally a number of needles about three inches, and about one-eighth of an inch apart. These poles were about ten feet high.

"What is that?" asked Sayre of our guide.

"That is an instrument that we are now working upon. Are you an electrician?" he asked.

"Yes," replied Sayre, laughing, "but I cannot possibly expect to compete with you."

"Well, there is one point that our Chief Electrician desires some information upon, and I will take pleasure in introducing you to him, as you may be of some assistance."

Little did I think at that time that this conversation and the result of it would mean my release to the surface of the earth.

We then passed into the Department of Music. This was also electrically controlled, and in this manner:

In the temples and private homes, as well as, we afterwards learned, in the concert and recreation halls, were installed a number of golden wires, near the ceiling. Just beneath these wires was a small bellows-shaped instrument, and attached to that was a series of plugs. When it was desired to have music, a button was pressed below this instrument, which indicated the music desired, and automatically air was forced out through the instrument directly upon the wires. I have never heard such wonderful music as that produced by this instrument. You can imagine the plaintive and the throbbing notes produced. I heard many of these play while in Cauphul, and the tendency of the music was that of our nocturnes in a minor key, though I did hear a few marches; and the instrument played in the Temple of the Gods at the wedding we witnessed of the Seventh Prince's daughter was beyond all description.

For hours our guide led us through this marvelous university until our brains were weary and the senses overwhelmed with the wonders that we saw and heard.

The next morning we were taken to the College of Incula. We were asked if we desired to see their courts and learn something of their laws. Upon our unanimous approval, we were conducted to the outer court and given in charge of one Neri, who would correspond to one of our American attorneys. He explained to us briefly their legal customs, which were as follows:

They did not have a jury system. All cases, both criminal and civil, were tried before nine judges. These judges were appointed by the nine princes, each prince appointing one judge, and the tenure of his office was for life, unless he violated any of the set codes and precepts, upon which violation he was put

to death. Any testimony whatsoever involved in the transaction was admissible. Hearsay and conjectures, as well as opinions, were admitted as freely as conversations and statements by those who witnessed or were conversant with the facts. Nor was there any taking advantage of technicalities, as is so often practiced in our courts. The cases were usually tried within a few days after the cause of action occurred, investigation having been in the meanwhile made by the deputies under the clerks, who registered the complaint. If their report specified that a cause of action existed, the case came to trial. There were very few civil actions, owing to the fact that their general laws of codes prescribed the rules of business, and if any of these rules were violated, and proof of the same was had by a deputy, the offending party was either heavily fined or his permit to transact his particular line of business was taken away. There was no such thing as damage suits for loss of life or for personal injury.

Neri, with great pride, gave us the leading criminal case of their realm, which I will describe briefly so as to give you an idea of their procedure:

CHUZIN, the beautiful daughter of the Fourth Prince, in the reign of Mu, was married, much against her will and her consent, to a nobleman some thirty years her senior. He, being busy with State affairs, neglected his young wife. She, having nothing else to do, schemed to have certain young officers of her guard secretly brought before her. The man employed by her as image-maker would, at her request, make a small wooden image of her favorite, and after she tired of him, he was killed. The small wooden image was kept in her apartments. She followed this cruel mode of entertainment until she had over twenty wooden statues. The bodies of her lovers were secretly removed and destroyed, and great was the wonder of the court as to what became of these men. It appears, however, that one day she repented somewhat of having killed her last favorite, and had placed upon the head of his statue a ring worn by him at the time of his death. When her husband paid her a visit, he observed the ring upon the image and recalled the fact that he had given this ring to a certain young officer in the guard for services performed. Her husband said nothing to her about this, but found, through spies, that two nights later his wife was to have an entertainment in her apartments. He secreted himself with some of his own guards and attendants in the tapestry, and observed her fondling her latest subject. She was observed, after she had heaped honors and praise upon him, to give him a glass of wine, which he drank as a toast to his mistress. He immediately fell over, and soon expired. Her husband then burst into the room, and she was taken prisoner and tried. At the trial, all of the law and former precedents in such cases were called into question. The trial lasted for two years, at the end of which four judges found her guilty, four not guilty, and one refused to commit himself. The matter was then taken up by the nine princes of the realm, who sat as the highest tribunal, and their decision was practically the same—four to convict, four to acquit, and one non-committal. It was finally decided to leave the matter in the hands of the Gods, and was decided as follows: The young wife was blindfolded and taken into a large vacant chamber. At one end of the chamber was a prince who had found her guilty; at the other end of the chamber was a prince who had found her not guilty. She was given nine moments to walk around the room, and at the end of that time the prince who was nearest her would find her innocent or guilty. Her steps were left in the hands of the gods. She stopped at the end of the nine moments within three feet of the prince who had found her guilty, and the next day she was publicly executed by having a silken cord tied around her neck, which strangled her to death.

The prince suggested that if we were each lodged in separate homes, we could become more proficient in the language and customs of the Atlantians, who were very proud of their progress.

The family I had the pleasure of residing with was that of Jaro the Second, who was the Assistant Manager of Canals. He was employed by the city and paid a salary therefor. As his home was typical of the other well-to-do residences of the city, I will briefly describe it.

The building was one story high, built of marble and coral and contained about fourteen rooms. The rooms opened upon an enclosed patio, interior courtyard, which was quite large—I should say, at least 150 feet long—at one end of which were the baths, one for the men and one for the women.

This family spoke the English language very well, and it was here that I met Nesta, who afterwards became my wife. I shall never forget the first time I met her. She was seated upon a divan near the baths, cross-legged, working upon some household article.

As this is not a love story and I do not desire at this time to enlarge upon personal matters, and especially as my wife is somewhat sensitive on the subject, I will simply state that for me it was the old story of "love at first sight." Further developments will speak for themselves.

A DAY or two later, we were strolling down the avenue of Maut, the Prince of the Ninth Day, and were observing the delicate shades and tints of the flora. In the canal our attention was attracted by a laborer, one of the Deep Folk, who was endeavoring to reach some particular flower with a long pole. As he was leaning over the edge of the canal, Maut came rapidly towards him and with a sardonic laugh, kicked him into the water and then turned and rapidly walked away. One or two other laborers there, did not dare attempt a rescue of the unfortunate man, as it would bring down upon them the displeasure of the erratic prince. The water was quite deep, and I could see that the man was struggling. As I was under no obligation to the prince, I threw off my coat and plunged into the water and pulled him to shore. As he struggled up the bank, he cast a look of hatred at the departing prince, who had not even turned around and muttered, "the day is approaching Maut for you, and woe

unto you." He then turned and thanked me, saying his name was "Nu" and that he would not forget my service.

In going over my notes, I find reference to the entertainment of these wonderful people and at the earnest request of my good friend, Mr. Martz, the well known coach at the Western University, I will give an account of an evening spent with him, and our good friend, the Prince of the third day.

We were conducted by our faithful friend and companion, Gauch, to the palace of the Prince, which was situated about a quarter of a mile from the lofty temple to Eos.

This building was similar to the other buildings of royalty, and was constructed of different colored marbles, the patterns and designs of which were so interwoven, that it made a most pleasing and harmonious combination.

The banquet chamber, to which we were led, was a room about 200 feet long, 150 feet wide, and possibly 50 feet high. The walls were hung with beautiful tapestries, while directly over the Prince's throne was a wonderful marine picture. The lighting effects were so arranged that, as formerly mentioned, it gave the impression of the sea in motion. Instead of chairs, we reclined upon couches, thickly padded and covered with brilliant robes. The guest could either sit or recline, as he desired, while for each one was supplied a stand similar to our smoking stands, upon which were various dishes of confections, fruits, sweetmeats and nuts. By pressing a small button, wine would flow. After we were seated, Ross smilingly remarked to me that they reminded him of the water founts attached to dental chairs, and I can think of no better description of them.

There were, I should judge, about 200 present, and after we were all seated or reclined, the High Priest of the Temple of Eos entered, followed by a number of his deputies or under-priests. As this banquet was given in honor of a fruitful year, these under-princes bore vessels containing the first fruits. Many of the fruits we did not recognize, but among them we noticed the orange, pomegranate, date, grape and guava. As the procession entered the room, the musical wires near the ceiling commenced a very pleasing march. This was continued while they circled the room three times. They then heaped their gifts in front of the Prince, who was seated upon his throne, and chanted the following incantation:

Thunder and lightning, brother and sister,
See, fair mistress, how thy brother
Breaks the shells in little pieces.
From the blows is born the lightning,
From his blows, the hollow thunder,
Thou, too, Princess, drawest water,
Sendest rain and snow and hailstorms,
To such office, Viracocha,
Founder of the world and quickener,
Destined and created Thee.

(*Note*): I am indebted to my wife for the wordings of these chants and legends, as she had learned these by heart while she was still a school girl.

We all noted the wordings and terms used, which Ross informed us were similar to those of our Indians, and van de Gould assured us that the folk lore and traditions and, in many instances, the almost exact wordings, were handed down through the past generations from the Atlantians, thence to the Mayas, and from them to the North American Indian tribes.

SORAC, who was seated with us and held a post of honor in the Temple, informed us that this invocation was given in honor of Light, the words relating to the tradition that the sun and moon were brother and sister and the sun had blackened the face of the moon so that he could find his little sister in the day time.

After this invocation there were many long and wearied speeches, and it grew so tiresome that Ross solemnly assured us that it reminded him exactly of a banquet in Boston, and Sayre, who smiled openly at this sally, was quickly given to understand by Gauch that he had better behave himself, as this was a very solemn occasion.

After the speeches and compliments, which were given with many high-sounding and lofty words and phrases passed back and forth, the stringed organ sounded a lively air, and in trouped a bevy of dancing girls. I must confess that their dancing did not differ very much from that we see upon the stages in America. They were very graceful in their movements and made a very pleasing picture. The one thing that did astonish us, however, and seemed out of order, was that, whereas our dancing girls are usually very scantily clad, these dancing girls were dressed from head to foot, being covered with beautiful feathers and plumage of the most brilliant hues.

After this dance was over, the Prince made an address, at the close of which he paid us a few words of welcome. We had been previously informed by Gauch that this would be the case, but that we were supposed not to pay any notice to it whatever, as it was considered very bad form to make any reply to an address of welcome; your presence there was understood as your reply. I am sure if this practice was carried out in the United States there would be less tiresome stories and a great saving of meaningless oratory.

At the conclusion of his address, at a signal from the High Priest, we all arose, and raising the forefinger to our head as before explained, received the following benediction: "When Time draws to an end, it is decreed that worship of the Gods shall also cease; then shall the world be purified by fire, and happy he who lives to see that day, if, with contrition, he has mourned his sins."

The assembly then broke up into small groups, and we were introduced to many of the citizens of the city. Sorac then invited us to come out in the garden, where tach would be played for our benefit, explaining that tach was a game. We went out into the courtyard and

took our places with other spectators around an enclosure about 25 feet long and 15 feet wide, at one end of which was set up a stone, similar to a huge grindstone, about six feet high, in the center of which was a circular hole, possibly six inches in diameter. A line was then drawn some eighteen or twenty feet from this object, and two players, with sticks resembling hockey sticks or golf clubs in their hands, each addressed a ball something like our tennis balls, and tried to drive it through the hole in the center of the disc. There were about five or six players upon each side, one side, we were told, representing a certain secret society of the university, and the other a similar society from the priesthood. We were all then asked to place our bets, and a bookmaker with pad and pencil passed among the gathering placing bets. No amounts were specified; you simply designated the side you thought would win. The game then commenced, and it was quite interesting to watch the skill with which one and then the other deftly drove his ball through the hole. The game continued for about fifteen minutes, at the end of which time it was announced that the priesthood had won. Ross and van de Gould had placed their bets upon the other side, and, much to our surprise and merriment, they were gravely approached and told that it was time to pay their bets, the payment being all of their wearing apparel. Ross, who had dressed somewhat fastidiously for this occasion, was for a moment nonplussed, but entered into the spirit of the occasion, and laughingly handed over his apparel, with the exception of his body tunic and sandals. The good grace with which these bets were paid had a great deal to do with our popular reception among the citizens. We learned afterwards that they considered this game among them the most devilish and sporting event they could contrive.

SAYRE was very much interested in the experiments carried on in the Electrical Department, and spent all of his time working on the strange-looking machine we had seen on our first visit there.

About four days afterwards, he informed us that they had at last perfected the device, and that it would be given a secret demonstration the next day at high noon, and that we were asked to be present.

The following day we were all on hand. Outside of our immediate party about twelve or fifteen scientists were present, and the Commander-in-Chief of War, a man who was also of the nobility.

The machine was set up in an enclosure that was part of the University, and was similar to when we first saw it. Its principal parts were two bronze-colored poles, about 15 feet high. These were placed some fifty feet apart, and had extending from them, pointing toward each other, a number of steel needles. We were assembled about twenty feet away, and Sayre was given the honor of turning on the electricity, or whatever it was, because I never definitely learned whether it was electricity or some other process or discovery that they used in its operation. However, as soon as it was turned on, we detected a bluish sheet that seemed to exist between the two poles. We were then each given an object and told to throw it between the poles, but, much to our astonishment, as soon as the object reached this bluish sheet, it instantly disappeared, and Sayre then informed us that this instrument, when in operation, would immediately dissolve into infinitesimal atoms any object that tried to pass between the two poles. The principle, it seemed, was on the basis that one was a positive and one was a negative, and that between the two a powerful current of some sort was passing with such rapidity that any object touching it would become annihilated.

After the demonstration, the Commander of War was very pleased, and in token of his services rendered, pinned upon the breast of Sayre a magnificent jeweled emblem.

On our way home Sayre informed us that the Deep Folk were again rising in rebellion, and that serious difficulty had been experienced in some of the far-off provinces; that they had perfected an electric gun which was capable of destroying any object it reached with its discharge, and that Argon, the Commander of War, was much worried, fearing an attack upon the City, and that it was his intention to immediately place around the City a complete circle of these instruments, so that, in the event that an attack was made, it would be possible to beat it off.

A few days later a controversy arose, as we were informed, regarding some of the Deep Folk who had presented a petition to the Princes to be allowed to enter the City as citizens. Jaro said that it had recently been discovered that some of the Deep Folk had perfected certain workings with the dimensions, and that their investigation had produced great excitement at the University. The word dimension here is improper, and I think the word used by the Atlantians is better; they call it metromes, which are as follows:

The 1st and 2nd are Negatives; the 3rd Positive; 4th Time; 5th Space; 6th Speed; 7th Sound; 8th Thought; 9th Light; 10th Force; 11th Equals or Exacts; 12th Absolute; other metromes based upon combination of the above were being determined and calculations fixed; length and breadth were unknown to exact science. Our conception of the 4th dimension is an assumed or supposed dimension whose relation to the recognized dimensions of known value, is analogous to that borne by any one of these to the other two, to explain equations containing four variables in analytical geometry or as an entity beyond the limitations of ordinary existence.

I have in my notebook a mass of data pertaining to the workings of the above mentioned, but it is impossible to give any more mention of them at this time.

I have just received a telegram that makes it imperative that I leave at once on the Relief Expedition and I must of necessity bring this narrative to a close.

I shall never forget the last night I spent in Cauphul. Events and happenings crowded upon each other with such rapidity that my mind is still confused as to how it all happened, but, briefly, it was thus:

ABOUT six o'clock that evening, as we were having dinner, the room was suddenly plunged into dark-

ness, and as we felt our way out into the street, we found the whole city as black as night. Other families were also coming out into the street, and we heard a confusion of questions and voices. Suddenly, near the College of Xeoyuoia arose an unearthly sound, and through the enunciator in every home we heard this message: "The Deep Folk have attacked; fly for your lives." This was all. I remember that Nesta clasped me by the hand and said, "Come, we will seek the subterranean cellar," and called to the other members of her family. But suddenly a shower of death-dealing missiles were scattered around us in a perfect hail, seeming to come from above, and we heard the cries and groans of those who were struck. Fortunately for us, the new electric machine, previously mentioned, was in operation for about two hundred feet near by, and we were protected from the storm of heavy materials hurled in our direction. It was this, I believe, that saved our lives.

Through the Stygian darkness, we fumbled our way back and were about to enter the cellar when suddenly a hand grasped mine, and a husky voice exclaimed, "You befriended me once; come with me now," and I recognized the voice of Nu. With Nesta by my side, we followed our guide, who led us into the subterranean cellar, where he quickly flashed on an electric spot-light. Conducting us through an almost forgotten corridor and up to what appeared to be a solid wall, he swiftly reached down, pressed a hidden spring, and a door rolled back, exposing another cavern. Into this we went, and after a short distance he led us to another concealed door, which, when opened, revealed a tube, such as was used in transportation from one end of the domain to the other. We quickly took our seats, the door was closed, and, with a slight shock, we knew we were on our way—where, we did not know.

Throughout the journey, which must have lasted several minutes, Nesta and myself sat helpless and speechless. Whither we were bound, we knew not, and while I was trying to collect my thoughts, I heard her crying softly. I endeavored to comfort her, but through her broken sobs she told me that it was what they had long dreaded, that the Deep Folk would attack and utterly destroy them.

A slight click, and the door was suddenly opened, and our guide hurried us through another tunnel, where we found another tube awaiting us. In this tube were several other citizens. We were quickly shut up, and the car in this tube started on its journey.

Four times we changed from tube to tube, until finally we stopped and were led out into a large cavern, which was lighted by a reflected light from above. My Deep Folk friend, Nu, quickly came to us, and said "Surface Man, is this woman your wife?"

"No," I said, "She is——."

"Then she must die," he said, and started to lead her away.

"Stop," I cried, "I will marry her now."

"Tis well," he said. By so doing, you both escape. "We never forgive and we never forget, but hasten," and following him we were led into another chamber.

He left us for a moment alone, but quickly returned with one of his own priests. Pointing to us, he said, "Marry them," and we were married at once.

We were then blindfolded and placed in another tube. We had the experience of going upward, and soon found ourselves in an upper stratum, and could hear the pounding of the ocean. Our guide here removed our bandages, and pointing through a dimly lighted cavern, said, "Walk to the end of this cavern; there you will meet another; obey him," and giving us a salute, turned and re-entered the tube and vanished.

We stumbled through the cavern for about seventy-five feet, and when we arrived at the opening, we found ourselves upon a beach with the ocean near us. It was early in the morning, between day-break and sunrise.

As we came out of the opening, a man came toward us, scanned our faces for a moment, and then abruptly blindfolded us again.

We were then taken and placed in a boat, and given something to drink. We did not regain consciousness until we found ourselves upon the deck of the Spanish Ship, *Don Carlos* bound from Rio Janeiro to Baltimore.

After we had recovered somewhat, we were informed that we had been picked up a few hours before, in an open boat, but that no name appeared upon the boat. It seemed that we had only been in it a short time and there was much speculation as to where we had come from, as the sea was quite calm and there was no sign of a wreck anywhere.

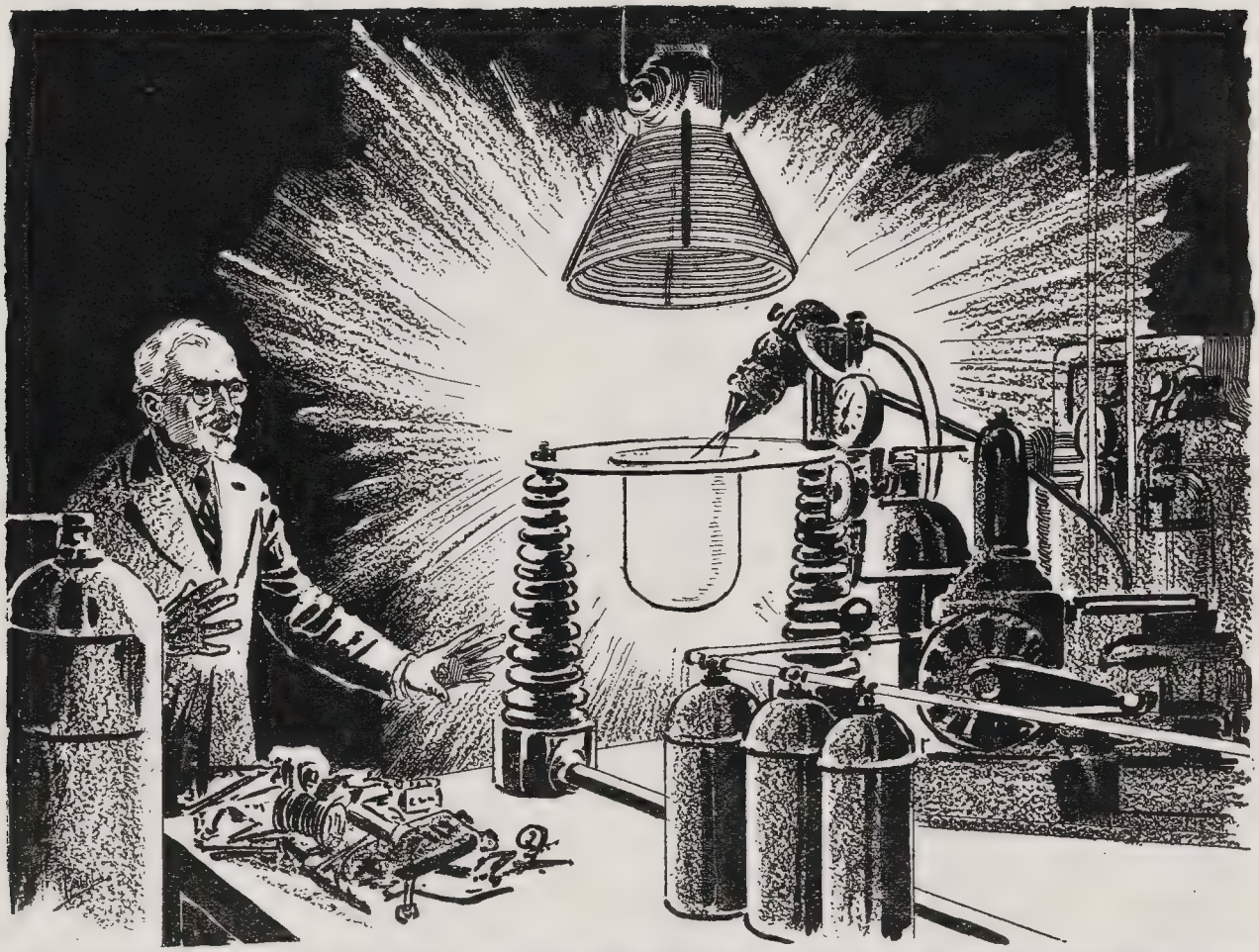
Nesta and I determined to keep the facts of our escape to ourselves, so we invented a story that satisfied the officers of the boat. This was easily done, as we could not speak Spanish. The first mate only spoke broken English.

In closing I will say that we are now working upon a perilous venture. Will we find the hidden Lost City again? Was the insurrection subdued? Will our friends be alive, waiting for us? Time only can tell.

THE END

ABSOLUTE ZERO

By Harold Moorhouse Colter



The fall breezes must have witnessed strange sights as they whirled past his window. There was the old gentleman standing before the glass jar, like an ascetic before a shrine . . . It became a serious business to him, this feeding of the child of science that knew no satisfaction.

THE inhabitants of the little village of White Manitou are uncertain as to who should be blamed. It was hardly fair to put all the onus on the meagre shoulders of Mr. Jones. In fact, it would be a rather difficult thing to do, because that gentleman was resting peacefully about six feet underground in the little churchyard. Furthermore, no one was at all sure that he had any shoulders at the time of his burial. He had been carefully scooped into his coffin, the performers of the ghastly deed looking the other way, while they did their painful duty.

But here was the crux of the whole matter, in the opinion of the villagers; someone had to be blamed. There were those who condemned the hydro for extending its services to the village. Others held that the agent who sold the electric refrigerator to Jones was responsible. Which leads to the conclusion that no one knew exactly what had happened.

Could it have been suicide?

Absolutely not! Did anyone ever hear of a man dropping through two plank floorings and crushing himself flat on the basement floor to produce the simple result of leaving this world behind? Again, absolutely not; in the first place, it would be practically impossible; and in the second place, the thoughts of such a gruesome procedure would

IMAGINE a baseball that actually weighs a little over fifteen tons. No one would be strong enough to lift such a ball; it would require a high-power derrick to lift it. What material would such a ball contain? There is no name for it. Nevertheless, the material exists in one of our densest stars, such as the small satellite of Sirius, which weighs not only much more than our own earth, but almost as much as our sun.

Heavy as this material is, however, science knows still a heavier one—i.e., Neutronium. This element weighs some 60,000,000 tons per cubic inch. Neutron is the name given to the combination Proton-Electron. Although it has not been produced as yet, nevertheless it may exist. The minimum density of solid Netronium is four trillion times that of water.

This story is based upon these premises. It makes extremely interesting reading.

be too painful for most persons inclined to self-destruction. But since he was dead, obviously something must have killed him. Here are the facts related to me, together with my own ideas on the case.

The year 1925 saw the advent of the hydro-electric power line to White Manitou. The electric company had thoughtfully installed a transformer on the main power line and wired the two streets of the hamlet. Of course, it was just as thoughtful to have a polite young gentleman call once a month to collect promptly all that was coming to the company.

Shortly after the arrival of the hydro an enterprising refrigerator agent arrived in town. Within the first half hour he had sold Mr. Jones an electric refrigerator which immediately ensured his success in White Manitou, for everyone knew that old Philander Jones would not invest in anything which did not promise him a sure return on his precious money.

Unfortunately he was not gifted with the foresight to see that his latest purchase would give him a flying start on the road to ruin. Within a week, he was transformed from a rheumatic old miser clad in a suit that was green with age, into an enthusiastic old spendthrift with an intensely interested look on his face and a weird brilliancy in his eyes never noted before. And on what did he waste his once-treasured money? Wire, copper tubing, air-pumps, steel cylinders, books and electrical magazines were the least of his purchases. It horrified the neighbors to see the amount of express that arrived daily at old Philander's barn-like house.

Nor could his astonished fellow citizens grasp the significance of all this. Of course, not one of them would admit his ignorance for a minute, but just the same, some head-machinery that had been peacefully rusting for many years had to do some nimble work to get out its owner's edition on time, explaining the phenomenon. This hindered no one from broadcasting his (and especially her) personal views and even the most bewildered needed no great amount of persuading to hazard a guess. Most of them would admit: "The poor old fellow's gone off his head all right," secretly or otherwise regretting that he had been so hasty in buying the refrigerator. Or else, "Betcha anything he's going to make a fortune out of home-brew."

Whenever anyone summoned up his courage to talk to him, the old man did not cut him off short. Instead, he was a fountain of eloquence; but no one could follow his train of thought or grasp his ideas. He seemed to be living in a different world. Mr. Jones would only discuss liquid air, absolute zero and like foreign subjects, so that no one ever thought of chatting with him a second time. Soon the old man became disgusted and relapsed into his former gloom.

Perhaps if they had been able to look in through the windows of the second story of his house, they might have seen light; but again they might not have. At any rate, he had established an elaborate liquid air plant in the second story of his house. There were electric gas compressors into which cold water ran and came out steaming. Philander presided over this like a hoary old wizard.

"Only three more degrees," he exulted to the doctor, who was bandaging a badly frozen finger for him. "I have it down to two hundred and seventy below now. Only three more degrees. I've a cup full of liquid hydrogen up at the house now. You ought to see how it sparkles! It's as clear as crystal! Oh heavens! only three more degrees." The doctor smiled and agreed with him that it was wonderful, thinking that poor Jones was at the mercy of an hallucination. However, there was nothing to prove that he was dangerously insane; even if the women folk were afraid of him.

Another month slipped by and Autumn arrived in golden splendor. Every one became engrossed in the fall rush, and they forgot mad Mr. Jones. Nor was mad Mr. Jones worrying about them. Only one more degree now and absolute zero would be his for keeps.

ONE evening in the first week of September, the lamp light showed in his window until twelve o'clock. No one knew how much later it shone, for no one was awake to see. If any one had been up all night, they would have seen the light until it was drowned by the red rays of the rising sun. If this mythical watcher had waited until half-past seven, he might have been rewarded by a unique sight. At that time the door of Mr. Jones' house was flung suddenly open, and he rushed, hatless, into the street. He was also coatless and bootless. He ran down the road shrilly yelling at the top of his old voice: "Oh boy! Hurrah!" and "Hurrah! Oh Boy!"

All the early risers of White Manitou came running to gape at the weird spectacle. Mr. Jones seemed to sense something wrong and stopped awkwardly in the middle of the road. Finally he seemed to come to the conclusion that he had been shouting the wrong words. At once his face cleared and he started his rheumatic gallop down the short avenue again. "Eureka," he cried, and he made the whole town ring. Unfortunately he tripped over a clod of earth and fell heavily upon his chest, abruptly extinguishing his enthusiasm. He arose dejectedly and, gasping for breath, limped homeward.

He was deeply humiliated. He stayed indoors for the next week and a half and would see no one. Then he began to steal out at dusk and slyly pick up every bit of iron he found lying about to carry it into the house. He soon became bolder and made excursions down the back lanes in the daylight. These raids of Philander were always for the same thing—iron. His plunder was armloads of old plow shares, old mower guards; anything and everything made of iron. He must have gathered scrap iron enough to fill the house. Yet after his death the only iron found there was one old plow share and a baby-carriage wheel.

The short sunshiny days of autumn withered into the snow-filled gloom of winter. No one paid any further attention to the old man. At first it seemed as if he had some great secret which he wanted to tell to any one who would listen. But none of the villagers cared to learn his secret. Sometimes he would waylay one of the neighbors and try to tell him, but before poor Jones could get fairly started, the man would turn

coldly away or shrink from him in fear. His emotions came close to the surface in those latter days. Several persons had observed pathetic tears in his eyes after he had been shunned. One of these, tender-hearted but quite timid, summoned up his courage and returned to the old man to speak to him. He no sooner approached Philander than he was met by such a storm of imprecations and maledictions that he fled in terror.

The next morning Mr. Jones was found dead, crushed to a shapeless pulpy mass. It appeared as if something had fallen on him from a tremendous height and had carried his body through two floors to the basement. But this theory was proved impractical owing to the fact that the roof of the house was uninjured.

I happened to be there when his body was removed for burial. There were pieces of thick glass mingled with the flesh. I made some investigations on my own account but was unable to explain satisfactorily the results of my enquiries.

HERE is a brief outline of what apparently happened: Mr. Jones had for some reason crawled under the table upon which much of the liquid air apparatus rested. Part of the mechanism, a large vessel with double-thick walls, had fallen through and struck the old man with such violence as to carry him through the two floors. Further progress was arrested by the concrete floor in the basement.

Here was the great difficulty. What had forced that vessel downwards?

I wrote to one of my scientific-minded friends and asked him to help me in my dilemma. A few days later I received a post-card from him. "Neutronium. Now figure it out for yourself," it said. I gasped—the whole thing was clear to me. I sat down and wrote the details of the tragedy.

A FEW months previously Mr. Jones had purchased the electric refrigerator, and for some unknown reason had become extremely interested in the mechanism and operation of the device. A thorough study of the principle of refrigeration, based on the fact that compression creates heat, while the reverse operation produces cold, led him to investigate the process of the manufacture of liquid air. He was not satisfied with a theoretical knowledge of the subject and its applications. Being such a hardened old sceptic, he wanted to see everything for himself. Accordingly, he had installed a complete experimental plant. The natural consequence of his experiments with liquid air, was that he should want to approach as close to absolute zero as possible. Apparently he had reached the goal of his desire—which proved to be his undoing.

A large glass vessel stood at one end of the sturdy little table upon which rested much of the experimental apparatus. Over it was a spray nozzle through which liquid hydrogen was forced. The evaporation which occurred, turned a high percentage of the hydrogen into a metallic powder that fell on the bottom of the vessel. This was evaporated by some method of his own invention and as a result, absolute zero (the greatest degree of cold possible) was produced. That is to say—273 degrees Centigrade or 0 degrees Absolute scale. This process in an open vessel would apparently be very wasteful of hydrogen, but there was a hood over it that captured the excess gas and carried it to a liquefying machine.

During these investigations, he noticed a very peculiar phenomenon. A wire nail dropped into the vessel melted away into nothing, accompanying its disappearance was a discharge of static electricity, which did not raise the temperature within the container. This discovery gave him the greatest thrill of delight he had felt in all his dismal life. Every scrap of iron about the house was thrown into the insatiable jaws of the vessel. Profiting by painful experience, he hung several tufts of stranded wire over this strange creation to collect the powerful charges of electricity formed, each time a piece of iron was placed in the jar.

The fall breezes must have witnessed strange sights as they whirled past his window. There was the old gentleman standing before the glass jar, like an ascetic before a shrine. He would cautiously drop a piece of metal into it and then nervously start back as a purple haze sprang into being above it. It became a serious business to him, this feeding of the child of science that knew no satisfaction. One might almost compare it to an ancient heathen sacrifice. Scarcely a moment went by but what a piece of metal was sinking silently into apparent nothingness. Tons of iron and steel found their way into a glass jar no bigger than a magician's silk hat and into oblivion.

Then came the fatal morning. His nervous system was strained to the point of breakdown. A careless thrust of a piece of iron into the glass. A flash of electric current that knocked him under the table. A deafening crash and Philander Jones was no more.

Neutronium! That was the answer. A single electron united with a single proton to form a substance of which only one cubic inch would weigh sixty million tons. The cold of the vessel had made the mad whirl of the electrons about their nucleus cease. Electrical conditions were suitable for the union which took place. Oddly enough, the cold walls of the vessel retained the neutronium which gathered on the bottom of it. The deposit was only a slight discoloration but it weighed many tons. The fact that the table collapsed the moment that Mr. Jones was beneath it was a strange coincidence but may have been due to the extra vibration caused by his fall. Once the tremendous weight started in motion, it was almost resistless.

Mr. Jones was not a scientist, he was only an experimenter of short experience; hence he left no accounts of his experiments. It would have been interesting had he done so.

Some of my friends have found difficulty in accepting my explanation. They have questioned me until I am sick and tired of answering them; perhaps because I am uncertain of the right answer. Why did the cold not dissolve the walls of the vessel as it did the iron? Why would no other substance but iron disappear? Why did the table suddenly collapse instead of sagging

(*Continued on page* 948)

The ROGER BACON FORMULA

By Irvin Lester and Fletcher Pratt

Author of: "The Great Steel Panic," and "The Octopus Cycle."

EDITOR'S NOTE:—This manuscript was found among the papers of Edwin Hart, following the death of that brilliant but unfortunate musician, last June. Those who recall the occurrence will remember that he was found in his room in a state resembling a cataleptic trance, and that he died without recovering consciousness. It is believed that he had taken an overdose of some drug whose nature has not yet been determined. The autopsy, however, failed to reveal any of the usual signs of drug addiction in the body of the unfortunate Mr. Hart, and we have only the following statement and conjecture to support the theory. After all, we know so little of the mechanics of the brain, that the thing is quite possible.

His description of life on the planet Venus is certainly within the bounds of possibility, for one group of scientists maintains that our sister world is perpetually doused in rains as fervently as the other maintains that it has no water vapor at all. It is certainly rather a fantastic description to be the work of an actual observer, however, and the police, following the discovery of the manuscript, have made a diligent but unavailing search for any trace of the old man with the ragged coat. The publication of this manuscript was withheld until the present time at their request, but it now seems certain that the old man with the ragged coat will never be found, and in justice to the memory of a fine musician, we feel that he should be allowed to present his case, however fantastic it may seem to the reader.

The Old Man With the Ragged Coat

IT was in one of those so-called "cafeterias" in Greenwich Village that I met the old man with the ragged coat and plunged into the remarkable series of adventures to which that meeting gave rise; a place of marble-topped tables and windows filled with vegetables of seed-catalogue dimensions flanked by uninviting pork chops, long since grown flaccid on their platters. The restaurant was something of a meeting place for the latter-day cognoscenti, and the old man with the ragged coat, I remember, had been sitting quietly at one end of the long table, sipping coffee, while the argument raged about him.

I have never been deeply impressed by the economic theories of Karl Marx, and when someone mentioned the "class struggle," I entered my usual demurrer, backing it by the statement that Marx had nothing new to offer. "Why," I cried, "read old Roger Bacon! That medieval monk anticipated and answered every theory your muddy German had to offer, and besides had a grasp of general science that makes Marx look like an ignoramus." Naturally this touched off the explosives, and in the end, overborne by press of numbers, I sought refuge in flight from the restaurant.

Somewhat annoyed by the argument, I was pacing along in moody silence, when I heard a step by my side, and an apologetic cough, that promised the onset of a panhandler. I turned; it was the old man with the ragged coat.

The village, as it is termed, has been the haunt of many literateurs, and of numerous oddities too.

"Pardon me, sir," he said, "but I heard you speak of Roger Bacon with some appreciation back there, and since Bacon students are rare, made bold to seek your acquaintance."

"I'm not much of a Bacon student, I'm afraid," I answered, "but I do think the Bacon manuscripts, forged or not, are very remarkable productions."

"Forged?" he said, with something approaching heat, "I do not deal in forgeries. . . . Oh, you mean the Parma manuscripts, translated by Newbold; those in which he describes annular eclipses and plant reproduction. But those are the least part of his work. Roger Bacon, sir, was the greatest scientist the world has ever seen. If it had listened to him, it would now be six centuries further along the path of civilization."

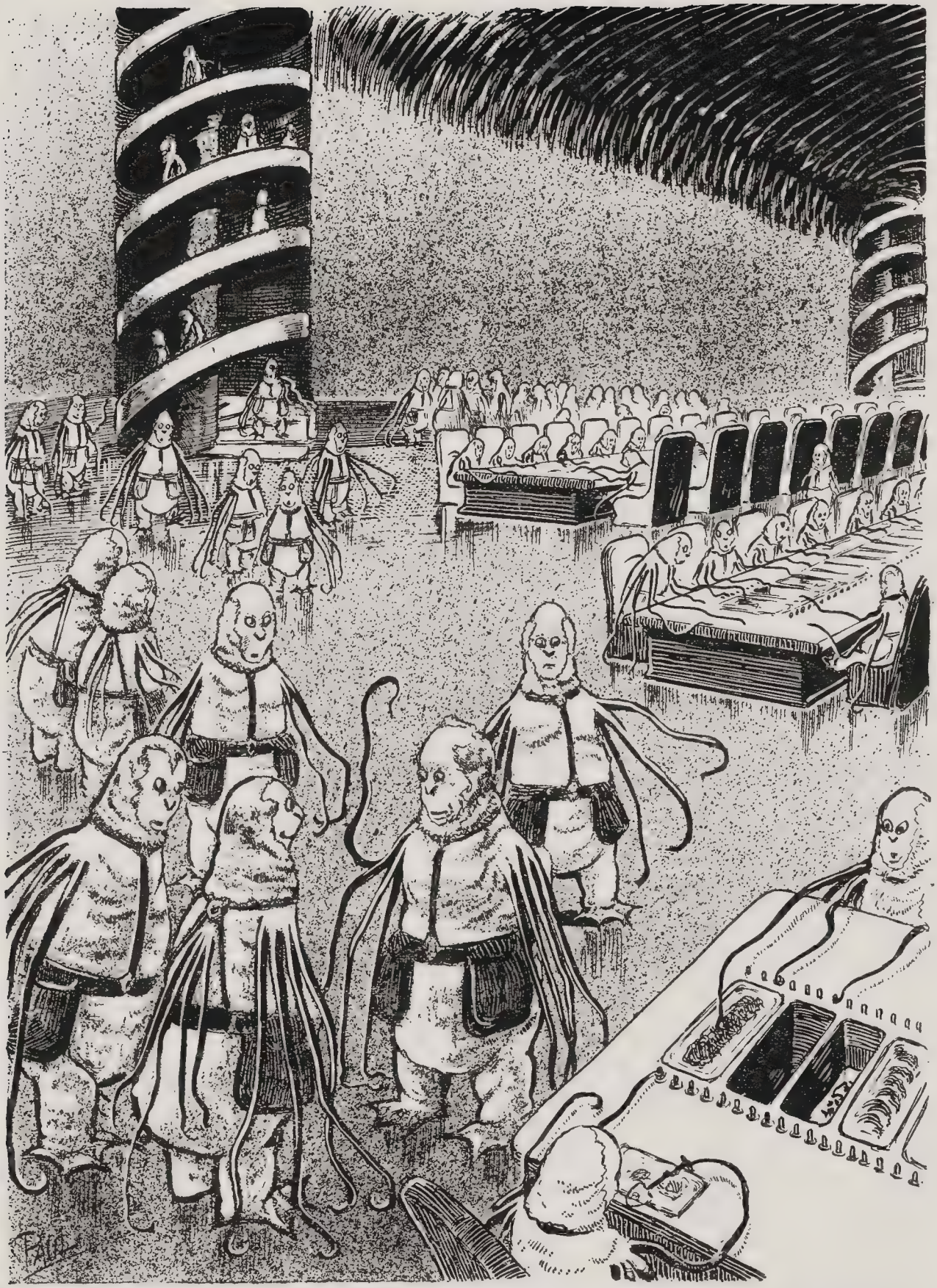
"Yes?" I said encouragingly. The old man interested me.

"Can you spare a few moments to come up to my place. I have something that would interest you. Roger Bacon, sir, made scientific discoveries that the world is not even yet prepared for."

I fell into the old man's humor. Why not? The night was young, and the hint of a discovery that "the world is not even yet prepared for" promised well.

ROGER BACON (about 1214-1294), a Franciscan monk, was also an eminent scientist, whose writings on physics, chemistry and philosophy, were far in advance of the times. Some of his writings are supposed to be in cipher, and attempts have been made to interpret them. He is said to have predicted many inventions, among them being gunpowder, the airplane, the steamship and the telescope. He was one of the most far-sighted scientists of his day, and because of some of his views and theories expressed in his writings, he was accused of working with black magic, and was persecuted to a great extent.

The accompanying story, which is based upon a supposed Roger Bacon formula, therefore, makes excellent reading. In addition, it is a most unusual interplanetarian story that you will cherish for a long time.



The room was filled with an endless range of tables . . . they were composed of shimmering metal which I took to be silver. . . . At these tables in high-backed, chair-like seats of the same metal, I saw long rows of—beings I can only call them. They were busily eating and all talking at once, much like a terrestrial crowd.

He led me down crooked ways to Banks Street and up interminable flights of a dark stairway in an evil-odored building to a door which was flung open on a room surprisingly large, considering its location.

Its layout resembled the tower of a medieval alchemist more than any modern apartment. There was a long laboratory table of black wood, stained and scarred, on which an alembic (that now little-used chemical tool) was distilling some pungent liquid over a low flame. All around and about the alembic was a furious litter of papers, chemical apparatus and bottled reagents. A cabinet held rolls of something that by their appearance was sheepskin; a telescope stood by the single window and a sextant was flung on the low cot. To complete the picture, a huge armillary sphere occupied the corner of the room between the cot and the telescope.

"—the unity of all the sciences," the old man with the ragged coat was saying. "Roger Bacon's greatest contribution to human knowledge. Your modern specialists are coming to realize that every experimenter must understand other sciences before he can read the riddle of his own. What would the zoologist do without a knowledge of chemistry, the chemist without geology, the geologists without physics? Science, sir, is all one. And now let me show you—"

HE drew from the cabinet one of the sheepskin rolls, holding it out for me to look at. It was covered with the crabbed and illegible script of the middle ages, made more illegible by the wear and tear of centuries.

"A genuine Roger Bacon, sir, like all these. You know there are some years following his stay in Paris that have never been accounted for? It was my theory that he spent them at Citeaux, the headquarters of the order of monks to which he belonged. I went to Citeaux. I found them restoring the place after the damage of the war. Heaven bless the war! In some way, ancient vaults under the abbey had been opened by the effect of the shellfire. I poked about them for days, searching for some trace of the master, and I found these—these! They are the greatest of Roger Bacon's work."

"But did not the French government—?" I queried.

"French government! Bah! What does any government know about Roger Bacon? They never heard of these manuscripts. I saw to that. Immoral, perhaps, but necessary, believe me."

"Have you found anything interesting in them?"

"Interesting is hardly the word, sir," he gave a cackling laugh. "What would you say to an absolutely flat statement of the nebular hypothesis? And the theory of electrons and ions?"

"Is that all there?" I asked with some astonishment. My scientific knowledge is scant, indeed, but sufficient for me to know that these are considered new things.

"All that and more. Did I not tell you Bacon made discoveries still beyond the grasp of the world? Here, read this—" he groped among the sheepskins, produced one and shoved it into my hand. "But wait, you do not understand the medieval script. Here is the same script written out in a modern hand. You can read this, all right."

His "modern hand" was almost as bad as the medieval script, but I managed, after much close study, to make out this:

"De Transpositio mentis: He that would lett hys spirit vade within the launds of fay and fell, shall drinke of the drogge mandragordeum tille he bee sight out of eyne, sowne out of ear, speache out of lips and time out of minde. Lapped in lighte shall he then fare toe many a straunge and horrid earthe beyond the boundes of ocean and what he seeth there shall stound him much; yet shall he return withouten any hurt."

"What do you make of it, sir?" the old man with the ragged coat asked.

"That he was a drug addict," said I. "Mandragora is a fairly well known narcotic—was, even in the middle ages, I fancy."

"You are as bad as most of them," said the old man. "You have missed all the essentials. Moderns will never believe in anything except themselves. Now look again; he says not 'mandragora' but 'mandragordeum' and it's no copyist's error, for it was written in Bacon's own hand. Note also that he titles it 'de transpositio mentis'—that is, 'concerning the transposition of the mind.' He never imagined, as drug addicts do, that his body was performing strange things. What Roger Bacon is telling us here is, that there is a drug which will bring about that dissociation of the mind and body, which seems to occur under hypnotism, and 'withouten any hurt.' Also he says 'lapped in light' which is more than a hint of the use of the immense force and speed of light. Modern science would not believe it. I told you, sir, the world was not yet ready for all of Roger Bacon. Moreover—" and he paused with a quick glance at me—"in another place he gives the recipe for the drug mandragordeum, and I can assure you, sir, it is nothing like mandragora. I have made it, and experimented with its use; by its means I have traveled where only planets have been before, and I am here to tell it. It produces a powerful ionization of the cells of the middle brain, by action on the pineal—but you don't know what I'm talking about."

I looked hard at him. Was the old man mad, or had he indeed hit upon some discovery of genuine value among the sheepskins of this strange alchemist of Lincoln?

"You doubt me, sir? I grant it sounds incredible. But here; taste, try, drink this and see. It is the authentic drug mandragordeum of Bacon." He seized the flask into which the alembic had been discharging its contents and thrust it into my hand.

I hesitated, sniffed the flask. The odor was rather pleasant than otherwise, spicy and strange. When I touched a drop of it to my tongue, the flavor was that of a warm, rich wine. So genial a liquor could not be dangerous. I seated myself in the one chair the room afforded, and leaned back, looking at the old man, who watched me intently. After all, he liked me and believed me a fellow student of Roger Bacon. He would not willingly do me harm. I sipped a little of the liquor.

Into the Ether

AT once room and surroundings were blotted out in an intense burst of light, so brilliant that I closed my eyes to shield them from it. When I blinked them open again the light was still there all about me, but it seemed to be gathered into me from an outside source, as though I stood in a room penetrated by a single shaft of brilliance which flooded me while I gazed into the dark. I felt a sensation of lightness and freedom. I looked about me.

To my astonishment I was no longer in the laboratory. There was no trace of a room, only the winter sky, with stars twinkling far off in the distance. I looked down, and perceived that I was floating above New York like a cloud. Beneath and behind me a long trail of thin phosphorescence like a comet's tail led straight to the roof of one of the many houses of the city, evidently that from which I had come. It held me like a tether; I could go only a certain distance from it. I felt someone touching my hand, the light about me burned lower, and abruptly, with another flashing, I was back in the room.

The old man with the ragged coat was smiling into my astonished face.

"An experience, sir, is it not?" he said. "You did not drink enough to gain the full effect. Perhaps you would care to try again?"

For answer I took the flask from his hand, and closing my eyes, drank deep.

Again came the unbearable flash of light, the swift sense of motion. I opened my eyes to see the lights of New York gleaming far beneath, receding in the distance as I gathered speed on my strange journey. The long cord of light that had bound me to the room was broken, trailed off behind me. I was alone in the universe!

Clear and bright, Venus hung like a lamp against the vault of the sky. Toward her, the most mysterious of the planets, I resolved to direct my course if I could. Perhaps I could discover something of what lay behind those banks of cloud in which she is forever sheathed? Could I make it? Old Friar Bacon had promised that his drug should "let his spirit vade . . . toe many a strange and horrid earthe beyond the boundes of ocean" and surely Venus met this definition well.

Beneath, the earth was fading to a black wall on which land and sea were barely separable in the murk of night. Suddenly I reached the limit of its shadow; the sun flashed blazing from behind it and I beheld the skies as no man on earth had ever seen them, with sun and stars all shining together in steady brilliance, the nearer planets standing out like phases of the moon against the intense blackness of space. My speed increased; the Milky Way was a riot of gems, the moon a tiny crescent barely visible at the outer edge of the sun, on whose huge disk the diminishing earth had sunk to a black dot.

Venus grew from the size of a candle-light to that of a moon, from a moon to a great glowing shield of purest silver, and from a silver shield to a whirling and tossing mass of clouds that reflected the sun's rays with dazzling brilliance, a sea of clouds without a horizon. I reached them, cleft the radiant depths and at once was in a soundless and almost lightless mass of mist, without other knowledge of my direction than that furnished by the certainty that I was following a straight course.

The cloud banks ceased and I experienced a sense of the bitterest disappointment, for beneath me I saw only an endless ocean, heaving slowly under a heavy ground swell and dotted with drops of rain from the clouds I had just left. This, then, was Venus, a silent and sightless globe of water, without a trace of land or life, inhabited by fishes, if by anything at all. Not till then did I realize how lonely we men are on our planet with the universe all around.

My flight over this ocean was slower; I can only explain it by the absence of light due to the cutting off of most of the sun's rays by the perpetual clouds. Roger Bacon's drug, as the old man in the ragged coat suggested, and as I was to be certain of later, undoubtedly makes use of some property of light, but the scientific friends to whom I have suggested the idea have laughed it to scorn, and I am not enough of a scientist myself to tell how it all is.

At last I perceived in the distance a place where the clouds seemed to touch the surface of the sea. I drew near; it became evident that it was not the overhanging clouds but a thin mist that rose like steam, and when I reached the spot I saw for the first time on that strange plant a trace of land. But what a land!

The mist rose from a water-logged swamp out of which coiled a monstrous vegetation of a sickly yellowish hue, quite without any touch of the green of earthly growths. Here were gigantic mushrooms, twenty or thirty feet tall; long, slender, reed-like stems that burst at the top into a spreading tangle of branches; huge fungus-growths of fantastic and cloudy shape, and an irregular, twisting growth resembling vines that twined up and over the reed-like forms and clambered about the giant fungi.

There was no clear delineation of shore and sea. The swamp began with a tangle of branches reaching out of the ocean and simply grew thicker and heavier as one progressed. At last the ground seemed to be rising. I could catch glimpses of something that was not water among the crowding growths.

Still there was no sign of life or movement. The rain fell ceaselessly, the clouds blotted out the sun. And then—the first sign of anything more than inanimate nature on that macabre journey—I caught sight of a growth, like the round bulb of the fungoids, but too regular to be a fungus, among the tangle of vegetation. I made my way toward it. It was a huge half-orb of some material apparently harder and more permanent than the vegetation, rising out of it; a ball without windows or other openings, save for one placed at the side low down—a door of some kind. It stood open.

I made my way in. The door itself was of extraordinary weight and thickness, and inside the room was very dim. The only light was a pale luminescence like that seen on the sea at night, issuing from some invis-

ible source. As my eyes became accustomed to it, I perceived that I was in a vast hall, whose ceiling vaulted up behind me till it met a vertical wall at the other end. I had not realized from the outside that the place was so large. The apartment was without other architectural features, save for a hole in the center of the floor, set round with a curbing of some sort.

Approaching this with difficulty (and in the slowness of all my motions in comparatively dark places, I read the confirmation of my theory that the drug mandragordeum enables the ionized particles of the brain to use the power of light) I saw that the hole was a wide well, in which the sheen of water could be seen not far below. Out of the water rose a circular staircase, the stairs of which were broad and fitted with low risers.

The People of Venus

FROM behind the vertical wall at the end of the room came a confused shouting, and as I drew near it in the dim light I saw that it was pierced by doors, like that at the entrance, very thick and heavy. These doors bore horizontal rods at one side which I took to be the Venerian version of doorknobs; and above the terminations of the rods were deep slits which may have been approximations of our keyholes. I am by no means certain of this—indeed, all through my visit to this peculiar planet I was hampered by the fact that I know little of mechanics or chemistry, and am only able to offer observation and conjecture, and often observation of the least importance, where the trained scientist would have looked for the essential fact and given conclusions.

I passed through the door. I do not know what I expected, but it was certainly not what I saw. I was in a hall even larger than the one I had just left (the sizes of Venerian buildings are enormous), roofed, however, above in the dimness. At each corner of the room a circular staircase ran up to a floor above, the stairs being of the same type as I had seen in the well—wide and low.

The room was filled with an endless range of tables, long and very low, like those in a kindergarten. They were composed of a shimmering metal which I took to be silver, but I may easily be mistaken about this, owing to the dim light and my insufficient acquaintance with metals. At these tables in high-backed, chair-like seats of the same metal, I saw long rows of—beings I can only call them. They were busily eating and all talking at once, much like a terrestrial crowd. It was their voices I had heard.

The Venerians bore a comic-supplement resemblance to seals. They had the same short-barrel-like body, surmounted by the same long, narrow head, though the heads of the Venerians were very high and deep as became a greater intelligence.

Their legs were pillar-like muscular appendages, short, and terminating in flat, spiny feet, webbed between the four toes. I learned later that while swimming, these feet trail behind them, furnishing at once the propulsive force and direction for the effort. Accustomed as I was to the stout arms of earthly people, it was something of a shock to observe that the Venerians are quite without them, possessing instead three groups of tentacles which dangle from their bodies. Two of these groups are set at the place where the short, thick neck joins the trunk and a third set, much smaller, at the center of the back, high up. These tentacles reach nearly to the floor when the Venerian stands up at his full height of about four feet. Each group contains four tentacles, all of them being very prehensile and capable of independent action, giving the Venerian not only an excellent grip on anything but also the power of taking hold of as many as twelve objects at once. I am inclined to think that the tentacles of the back are just barely functional; only once did I see a Venerian use them.

Their heads were, as I have said, long and narrow, high and deep. The nostrils were wide and set right at the top of the front of the head, the eyes behind them. A pair of holes, which must be ears, are set low down and at the back. The mouth is small, low down, and in front. Altogether, the countenance resembles an animal's face much more than that of a man.

The Venerians in the hall were entirely innocent of clothing, and one and all were covered with a rough, coarse hair, except on their faces. Most of them wore a type of bandolier or belt, supported by a strap around the neck and in turn carrying a number of pocket-like pouches held shut by clasps of peculiar design, whose exact nature my insufficient mechanical knowledge did not allow me to determine.

Some of them bore weapons in their belts; short spear- and knife-like objects, with handles set T-shape for better grasping by Venerian tentacles, and also what I later discovered were explosive weapons with a bulb and tube above the T-shaped handle. All were entirely of metal—evidently there can be no wood in a land where the clouds are forever unbroken by any shaft of sunlight.

The Venerians were eating with little metallic spades, sharpened at the lower end for cutting. Their food was brought up to them from somewhere below by mechanical contrivances, which rose through the centers of the tables when they pulled small handles set into the tables in front of them.

The fare was not vastly different in appearance from what one would have expected on earth under similar circumstances; it seemed to consist largely of fish and fungoids, steaming hot and dressed with sauces.

The meal was now nearly over. Here and there a Venerian rose and passed down to the door with quick, shambling steps. I followed a pair of the weapon-bearers. They went straight to the well in the outer hall, and walking down the steps till they were waist-deep in the water below, turned suddenly and dived in. Beneath, the well turned into a long passage entirely under water and lit by the same dim radiance that illumined the hall above.

The meaning of the bodily form of the Venerians and their dim lights suddenly struck me. They were as essentially water-living as we are creatures of the land, and their eyes, accustomed to the phosphorescent glow of the depths, could not bear any stronger light well. The two I followed were amazing swimmers, moving

through the long water-filled passage with wonderful speed and hardly any effort.

Abruptly it widened; the light became stronger. The weapon-carriers directed their course upward, came to the surface (where I saw we were beyond the swamp belt and in the open water) and took fresh gulps of air through their elevated nostrils. Then, diving down again, deep beneath the surface, they coasted along slowly. I caught a flash of something silvery ahead in the water. So did the Venerians. One of them snatched the bulb-weapon from his bandolier, the other gripped his short spear; both swam faster.

It was a huge fish, his head and body covered with scaly plates. A long tail projected backward from this coat of mail and two big paddles hung near his head. A biologist friend to whom I have described it as a product of the imagination assures me that the earth once knew such monsters under the name of "ostracoderms."

It had seen the Venerians almost as soon as they had caught the flash of its plates, and fled down the watery lanes like an arrow—but not as fast as they.

The Venerian with the spear gained more rapidly than the other, heading the fish off with his barbed point and finally turning it back toward his companion. The other lifted his bulbous weapon; there were two muffled thuds, like the blows of a padded hammer, and the seven-foot fish wavered, then stopped, his paddles moving convulsively. The Venerian with the spear ranged alongside him, dodged the sudden fierce reflex swing of the armored jaws, and thrust the weapon in just at the point where the bony plate of the head met the cuirass of the body. The big fish heaved once more, then paused and began to sink slowly toward the bottom, but the two Venerians, each wrapping his tentacles around the animal's tail, began to tow him slowly toward the hall of the well.

Neither of them rose to the surface during all this. Their breathing apparatus must be marvelously adapted to staying under water.

Marooned on a Planet

SUCH hunts as that I had just witnessed were evidently only one feature of Venerian life. It was obvious that a people who could construct halls of such cyclopean architecture as that I had seen, who had attained such skill in the working of metals, as to produce the explosive weapons, and such mechanical ingenuity as to work out the elaborate serving mechanism in the dining hall, were a race of no small degree of civilization, and despite their aquatic habits, must possess establishments of some size on the swampy land that represented continents on this strange planet.

Filled with the desire to find these, I retraced my journey to the hall of the well. I found the outer room now filled with a varied crowd of the Venerians, some diving into the well and swimming off in various directions, some merely standing about and talking, and others going out of the door that led into the jungle of fungi. I followed a party of the latter, as the most likely to lead to something of interest.

They blinked as the bright light of the out-of-doors struck their eyes and I wondered what they would do in the dazzling sunlight of earth. After a moment or two they struck out, a group of five or six, up a gentle slope through the monstrous fungoid growths behind the hall. The vegetation was a perfect tangle. I wondered how these Venerians with their short stumpy legs could penetrate it, while off the beaten path, until I saw one of them blunder against the trunk of a sickly-hued tree-fungus all of twenty feet high and send it crashing to the ground as though it were paper. Then I realized that the greater number of these fungoids were no more solid than those of the earth-air blown things ready to fall to pieces at a touch.

The slope became steeper as the Venerians pushed on, kicking the big soft stems out of their way when they blocked the path. At last the track encountered a buttress of outcropping stone, where it wound around ahead. The Venerians paused; two of them who bore the bulbous explosive weapons stepped to the front and walking with some care, preceded the little group which had suddenly grown silent.

What did they fear? Some grisly monster of this wet and steaming planet, I fancy. At all events, as they rounded the rock, one of them lifted his weapon and fired in among the crowding growths. I caught a glimpse of a pair of hungry eyes, heard the sloshing thud of the fall of a big mushroom, the sound of heavy footsteps and that was all. The people of Venus, with their dank climate and wildly growing vegetation, must be far closer to the primitive terrors of the beast-world than are the people of the earth.

The Venerians followed their path through a little vale, till it ended at another circular building like the hall of the well. Within was the same phosphorescent glow which seems to be universally used there as a means of illumination; a cold, pale light produced by some means of which I am ignorant. All about the outer room of this hall were shelves filled with tools, with one Venerian in attendance, while another stood at the back before a window looking into a longer room, where one caught a glimpse of pulsating machinery.

The party I had followed, received tools from the Venerian in the outer hall, and came out again, following another path to the hillside behind the shop.

There, where a cliff towered out of the lowland, they entered a hole that had been dug in the stony face of the hill, and drawing from the pouches at their belts some balls that emitted the same light I had observed everywhere on the planet, they plunged in.

I have probably observed the facts that are quite useless and meaningless about the mining operations which followed, but I set down what I saw, in the hope that it will be significant to someone who understands more of these things than I do.

The Venerians mine by means of a shafted tool which is attached to a box about two feet square, by a metal cord, the box standing on the floor behind the miner and evidently furnishing the power for the operation. At the working end of the shafted head is a circle of powerful metal teeth, and beneath the teeth a basket of some woven metal. The Venerian presses the tool against the rock he is mining. It is pulverized by the

teeth (which spring into rapid motion with the pressure) and falls into the basket as a powder. When the basket is filled, he takes it to the power box, and lifting a lid at the rear of the box, empties it in and pulls a small rod. Immediately the box emits a strong red glow, and in a minute or two a bar of shining metal is discharged at the back and a little ball, probably of the residue or slag, drops out of an aperture beside it.

When a pile of these metal bars had accumulated, the Venerian picked them up and carried them back to the hall of the machines, where he turned them over to his mate at the window, receiving in exchange a metal token which he dropped into one of his pouches.

In the room behind the window the metal bars passed into the grip of complicated machines, whence they issued as completed tools and utensils. I did not examine these machines thoroughly; my limited mechanical knowledge would have made such an examination fruitless in any case, and I was more interested in the miner's box and its contents.

At each operation I watched the Venerian carefully, hoping to learn the secret of its power, but so rapid were his motions that each time I was baffled. Nevertheless, I remained in the shaft where he was working; sooner or later, I argued, he would fumble for a long enough time to enable me to gain an inkling of the box's contents, and such an inkling, transmitted to one of my engineering friends, might well have valuable results.

So much interested in it did I become, that I failed to realize the passage of time, and during one of the miner's visits to the hall of the machines, as I waited near the mouth of the cutting, I suddenly realized that it had grown dark. The miner, too, was gone an extraordinarily long time. I began to consider the possibility that he had finished his work for the day and had gone for good. There was, then, no sense in remaining where I was. I determined to set out on further explorations. To my utter horror I found I could not move an inch.

Clearly the action of Roger Bacon's drug utilized the force of light. But there was now no light. The feeble illumination of the miner's lamp even was gone; the day was done. I became impatient, worried; made another effort at progress. No result. I felt as powerless as one does in a nightmare, utterly deprived of motion. A cloud of fear began to close about me.

Outside there was the sound of some heavy beast crashing through the lush vegetation, the patter of the unending Venerian rain, and then, far away, the slow tolling of a gong. I was marooned on a planet millions of miles from home and with no way of returning.

The Flash of Lightning

AT such moments, despite the statements of dramatic writers, one does not rave and storm. I thought instead of my body, back in the room on Banks Street, and what the old man in the ragged coat would do and say, as it sat there in his one chair, lifeless and somnolent. Would he dare to call in the police or would he seek to dispose of it? Suppose I finally obtained release from my predicament and came flying back across space to find my body beneath the cold waters of the Hudson—woke to sudden strangulation at the bottom of the river?

Or would I remain thus disembodied, an ionized brain, afloat through all eternity? It was a pretty academic problem, whose pleasure was somewhat lessened by the fact that I was the object of what might be called the experiment.

I tried again to move—hopeless—and remembered a remark of Jack London's that the blackest thing in nature was a hole in a box. That was exactly what I was in—a hole in a box.

Then I wondered how long it would be before it became light. The next morning—how long were the days on Venus? For all I knew they might be fifty or sixty hours—quite long enough for the old man in the ragged coat to decide that I was never to return. And what of the necessity for nourishment of that body I had left behind in the room on Banks Street? It was in a state resembling a hypnotic trance. How long did people live in a hypnotic trance? I tried to recall all I had heard or read on the subject and came to the conclusion that the evidence on the subject was somewhat sketchy.

I was aroused from this reverie by a grunting sound, like that made by a wallowing pig, near the mouth of the cave, and saw a pair of wide-set and phosphorescent eyes gleaming in the inky black of the entrance. Apparently the animal, whatever it was, was disturbed by the smell of the cave, for the grunts changed to a grinding bellow and it backed out. Followed another series of grunts and the sound of heavy footsteps, and then a series of angry snarls. I heard a sound of heavy bodies hurled about. Two of the Venerian beasts were fighting outside my prison. Of all the events on that weird planet, this stands out as the strangest—those two monsters of what shape or size I do not know, snarling and biting at each other in deadly combat, out there in the rain, while I lay without power of motion within.

The battle trailed off to one side and ended in grunting moans which in turn faded into a sound suggestive of eating. One of the beasts had been victorious and was celebrating his conquest—noisily. Finally that sound also ceased, and there was only the steady beat of the rain.

It seemed to grow heavier. It must be raining harder, I thought, and wondered what difference a heavy rain made where it was always raining. Far in the distance I heard the rumble of thunder. They had thunderstorms on Venus, then, just as on earth.

The rain fell harder; again came the roll of thunder, nearer this time, and then peal on peal it was repeated, while I could see lightning flickering among the distant clouds. A new, wild hope rose in me. If one of those lightning flashes came near enough—

But it seemed that it would not. The lightning flashed among the distant clouds; the thunder continued to roll, but the storm seemed to be passing off to one side and away from me. I was giving up hope again and resigning myself to the inevitable, when, with a terrific roll of thunder, there came a dazzling flash.

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A. S. 1

In an instant I was out of the cave and off. Outside it was as dark as it had been before, but I was now in the open where I could travel on any flash of lightning that came. Eagerly I waited for the next, and with its coming rose half a mile in the turgid atmosphere. Another flash—and I was right among the clouds; another—and I was half way through them. I believed I could see the stars of space beyond. Yet another lightning flash below me, and with feelings difficult to imagine, I was out of the atmosphere of that grim and slimy planet and abroad on the ether once more. No mariner ever welcomed land as I did the sight of the sun.

. . . When I reached the earth and the room on Banks Street, dawn was just breaking among the skyscrapers of New York. My body was cold and numb when I stirred and opened my eyes to see the old man with the ragged coat looking at me with an expression of extreme anxiety. In his hand was a bottle of some stimulant and my lips were wet with it, where he had forced a few drops into my mouth. I choked, gasped and sat up, every motion a new agony, but an agony of delight, for I was back on the familiar earth once more.

"I began to think you were not going to return," said the old man in the ragged coat. "Did you have an interesting journey?"

I shuddered at the thought and held up a detaining hand. "What I want mostly is something to eat," I said. "Perhaps I can tell you about it afterward."

But I never did—nor have I ever gone back to the room on Banks Street where the old man with the ragged coat keeps his Roger Bacon manuscripts and makes experiments in medieval alchemy.

For I have always been a little afraid, a little puzzled. Was the drug he called "mandragordeum" after all, some narcotic, and was my strange voyage to Venus only a drug-dream? That the cells of the brain can be ionized and float in space is something science is not prepared to admit. I would not like to become the slave of a drug more deadly than cocaine; more deadly, because its dreams are more interesting and insidious.

And yet—and yet—my scientific friends tell me there is nothing impossible in the life of Venus as I have told it to them in hints and suggestions. I have been studying electricity, and another trip would be worth while, if only to learn the secret of the powerful and compact storage battery in the miner's box; this much I am certain of. Perhaps, some day—.

THE END

ABSOLUTE ZERO

By Harold Moorhouse Colter

(*Continued from page 939*)

gradually? Why were the pieces of glass, mingled with his remains, not too heavy to lift?

These were the simplest questions put to me.

Iron is a conductor of heat and electricity to a degree that non-metallic substances do not approach. That has been my answer to the first two questions.

The table was of very heavy material and the weight must have borne directly down on one leg of it. When Philander struck it, the slight deviation from the vertical made it snap under the weight, leading to the collapse of the whole table and the subsequent disaster.

And when I have said that, I tackle the last with a cheerful heart. Why were not the fragments of glass mingled with his remains too heavy to lift? I said that the only reason the neutronium had remained in the first place was that the glass was chilled to the lowest degree of cold possible. When the vessel was broken and away from the cooling action of the hydrogen, it became warmed and the neutronium atoms slipped through the loose molecules of the structure.

So let me triumphantly say that I have answered them all. Accordingly I lay down my pen.

In this department we shall discuss, every month, topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

TRANSMISSION OF THOUGHT WAVES BY RADIO

Editor, AMAZING STORIES:

I have been a constant reader of your magazine since the first issue. There has been much improvement from the time I read the first issue and your Quarterly Magazines are even better than the monthly. Jules Verne, Edgar Allan Poe, H. G. Wells, and Murray Leinster are my favorite authors. In your ANNUAL, the outstanding story was Edgar Rice Burroughs' "Master Mind of Mars."

There has been a question long in my mind that I have wanted to ask you. In Vol. 1, No. 9, there appeared a story, "The Telepathic Pick-up" by Samuel M. Sargent, Jr., that didn't seem right. Super Radio as the author termed it, is not necessary to pick up thought waves. In order to change the electrical impulse that is given off the sending aerial to the vibrations that our ears can decode, we must first know the "wave-length." Also there must be an electrical charge. There may possibly be a charge of electricity in the brain but it can not be strong enough to actuate a radio outfit. Of late much of my work has been on short waves. I am a radiotrician. Curious skip distances occur "Down under." We know that if we get down far enough the waves are absorbed by the ground. It is my personal belief that the waves are below the wavelengths now used or they must be far above it. Also when around 5 meters there is little above them. Also when around 5 meters there is little wire used. The circuit must be simple because the resistance in the wire tends to raise the wavelength. It seems to me that that fact shuts the low waves out.

I confess that I know nothing about the waves above 550 meters. In my mind the thought waves have to be above those used in Europe. Of course there may be a new circuit. The General Electric Engineers have, and still are trying new hookups. We have not yet reached the end.

Let's hear your end. That subject will always interest me because it is so near my line.

Wishing you the best o' luck in your magazine.

H. W. FENLAY,
149 Church St.,
Amsterdam, N. Y.

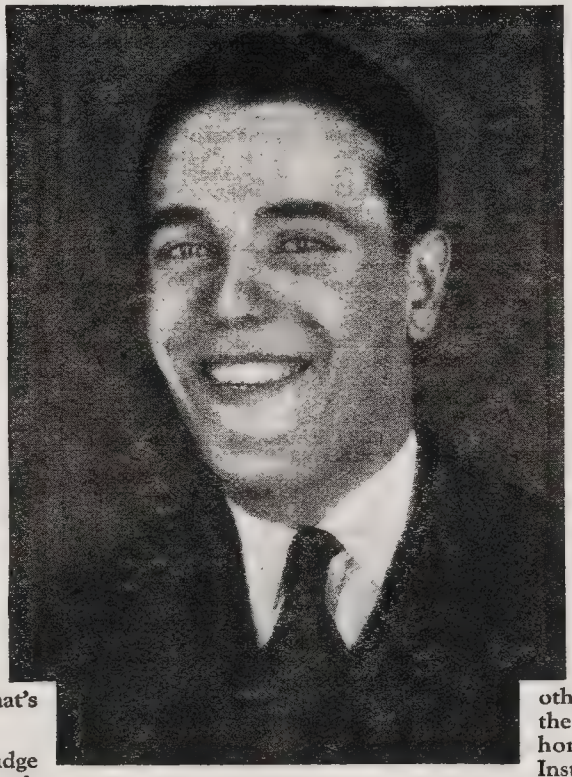
(We believe that it is going too far to take seriously the idea that there are such things as thought waves or that they are analogous to what we may call radio waves.—EDITOR.)

"How I Laughed Myself Into Success in Radio"

by Howard Clark

"I'm sitting on top of the world! My bank account is growing fatter every day . . . my home is all paid for . . . I've just ordered a new car . . . and my wife and I can at last enjoy life in real style. It sure feels great to be earning big money. And to think how it all came about!"

• • •



IT happened on a rainy Monday night. I was reading a magazine while Mary was clearing away the supper dishes. Suddenly a funny cartoon caught my eye . . . and I laughed out loud.

"Jim, you make me sick!" she cried. "How can you laugh while I'm nearly dying of weariness!"

"But Mary dear—"

"Don't dear me, you idiot!"

I was alarmed. "Great heavens, what's wrong?"

"Wrong?" she screamed, "here I drudge all day, do my own housework, wash all the clothes, take care of the baby, and worry about your meals. I never get a moment of freedom . . . and haven't a decent thing to wear even to church . . . yet you never seem to care!"

I was ashamed!

A feeling of shame swept over me. So that was why she seemed so "moody" the last few days! Like a good sport she had suffered in silence until she couldn't keep it in any longer. Poor kid!

For hours after Mary had gone to bed that night I kept staring into space. What a mess I had made of our lives . . . What a slave I had made of her.

Listlessly I kept thumbing the pages of the magazine . . . thinking . . . thinking. Was there no way out of it?

Then suddenly . . . as if by some kind act of Providence . . . . I stopped before a story. It told of a fellow who had made quite a fortune in an uncrowded profession. Fascinated, I read on. It told of the brilliant opportunities in the radio industry . . . of the big incomes fellows like myself were earning . . . and of the ease with which expert radio training could be acquired. But what impressed me most was the fact that success was practically assured by means of a new home-study laboratory method sponsored by three of America's great corporations.

With gigantic enterprises like these behind a school I needed no greater guarantee . . . . so without a second's further hesitation I tore the coupon and mailed it.

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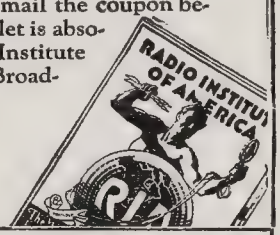

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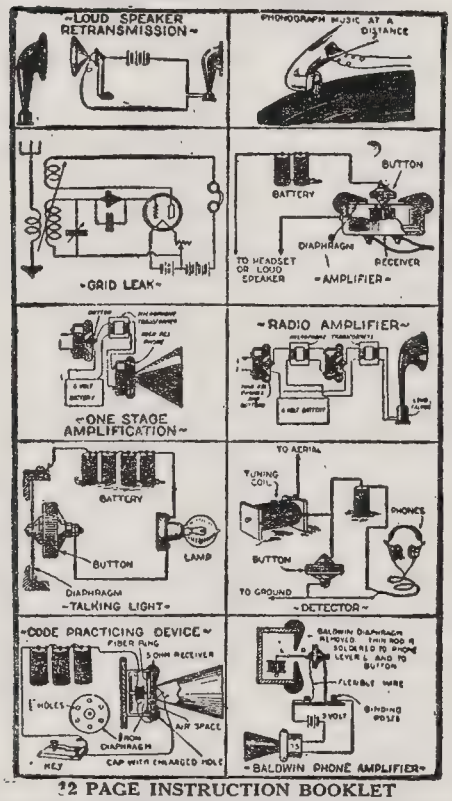

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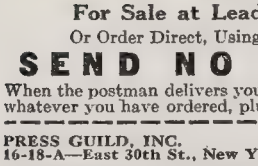

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Editor, AMAZING STORIES:

I have never written to you before although I have been an enthusiastic reader of your several magazines for many years. I also wish to congratulate you on the intelligent editing of your magazines and the cold science and warm fiction which you blend into your scientific articles.

I was prompted to write to you as I concluded the final instalment of Edward Elmer Smith's superscientific, truly marvelous story, "The Skylark of Space." I have read every story in your AMAZING STORIES Magazine, SCIENCE AND INVENTION and your other scientific publications but my vote goes unbiasedly to "The Skylark of Space."

I beg of you to induce Mr. Smith, with the aid of his collaborator, Lee Hawkins Garby, to produce another story introducing the same characters and our friends on Osnome.

You, through the channel of your magazines, are teaching us humans how truly insignificant we really are and what a long way we have to go to reach the Infinite of Knowledge.

Even now while listening to the most marvelous of modern inventions, the radio, I can dimly feel the pulse of the thousands and millions of future generations who will be using inventions we cannot vaguely imagine now, trying to impress us with our duty to the future by aiding our present struggles for scientific knowledge. My aid is going in the form of the several twenty-five cent pieces which I pass over the counter for your magazines and also by inducing other people to read your magazine.

I cannot offer any suggestion as to the improvements of your magazines for I feel that any suggestion I should offer would be negligible to the powerful promoter of modern scientific thought, "The AMAZING STORIES *Magazine.*"

I pass on with the words below to the slogan of all true Scientifictionites:

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HOWED J. BRADFORDE,
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(You have only followed other correspondents in admiring the "Skylark of Space." It was a very good flight of fancy with quite a lot of science in it to justify its place in AMAZING STORIES. But it is perfectly clear, that no matter how well meaning an editor is, he cannot please everybody. Even this story, for instance, which has drawn so much enthusiastic comment from our readers, has brought with a certain amount of adverse criticism also. We do not include questions or criticisms on the purely scientific angles on the stories. We mean merely the general brickbats and comment—constructive and otherwise—which inevitably follow a story on which opinions are strongly divided. But it would be most mortifying if we printed a story that pleased nobody, and we like "The Skylark of Space" so much that we are glad to find our opinion confirmed by you and others of our readers. —EDITOR.)

THE REACTION MOTOR IN THE "SKYLARK OF SPACE"

Editor, AMAZING STORIES:

There are two questions that I would like to ask in regard to the story entitled: "The Skylark of Space."

If a vacuum had been created around the "Skylark," would the occupants have been able to discharge their "X-Plosive" from the space flier?

Wouldn't the sudden (too sudden) change from the white hot heat to the snow and frost covered space-flier have ordinarily split the metal?

I am not usually critical in regard to stories of the future, but these two questions came to my mind as I was reading the last instalment of the story. It really was a very cleverly written picce of scientifiction.

The DISCUSSIONS Column is both amusing and instructive—Keep it up.

BOOTH REED
216 Euclid Ave.,
Hackensack, N. J.

(The thrust given by a reaction motor is independent of a vacuum. Of course, space fliers, which are absolutely imaginary and hypothetical, have to have various attributes given to them in stories. So we will have to suppose that the Skylark is strong enough not to split. We think that you can see from our comments in the discussion columns that this part of the paper interests us extremely. So many ideas are presented by our discussions contributors, that what they say makes very interesting reading. And the idea we have about the discussion columns is not only to keep them up, but if possible, to develop them.—EDITOR.)

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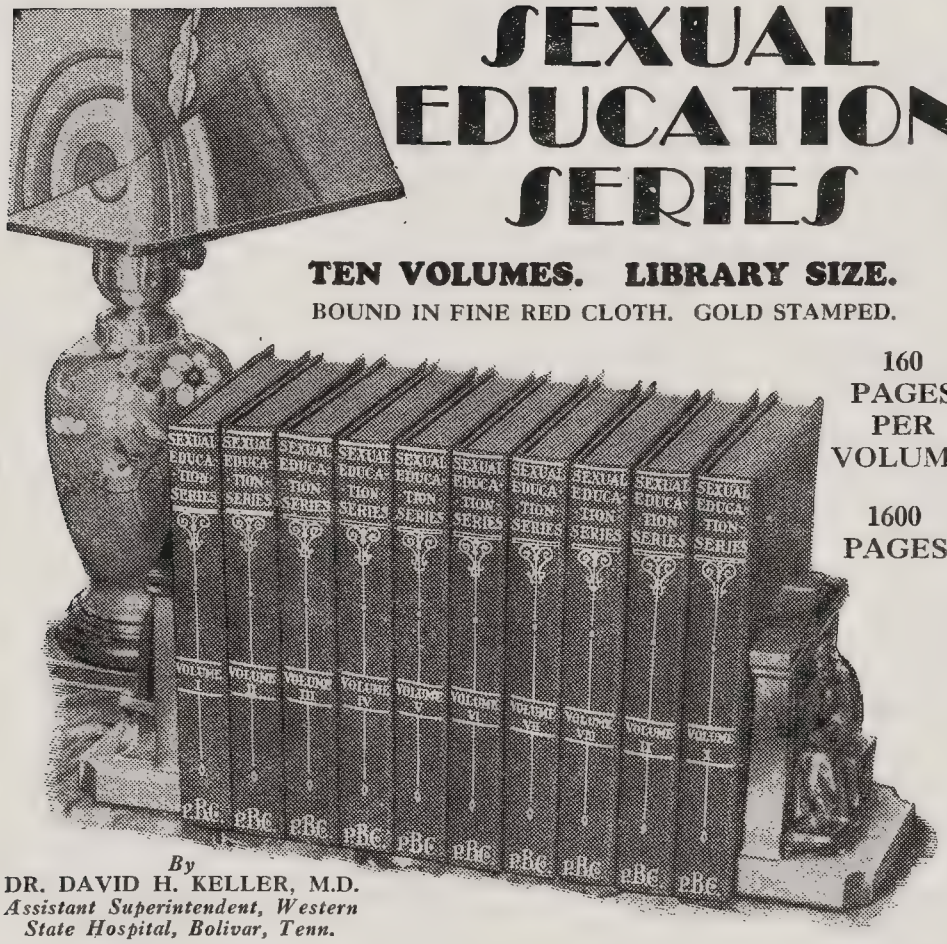

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Editor, AMAZING STORIES:

I have been a reader of Scientifiction for quite a while and have found plenty of food for thought. I have always wondered why you acknowledge the deficiency of your magazine by calling it as you do. Your reasons for its name are purely psychological, so you say, but in calling it that you attract to it the people who want to be amazed, not those who want to read good Scientifiction. I would have nothing to do with your publication if I had not known from SCIENCE AND INVENTION what its contents were to be. I venture to say that more than three-quarters of your present readers have been readers of SCIENCE AND INVENTION or have learned about AMAZING STORIES from a friend.

I have not bought many of your issues because of their exceptionally gruesome covers.

Many of your stories have been very good. Please don't try to satisfy the demand for interplanetary stories. The real good ones of that class are few and far between. The others just go through the routine. It is certainly very queer that every space flyer that starts for another planet usually gets there or at least out of the earth's atmosphere to another world. In many of your early issues I have noticed the tendency to give detective stories, funny stories, gruesome stories and adventure stories all in the same magazine. Please do not try to incorporate all of these into Scientifiction. There are separate magazines for all of them. Your authors have had a fine time playing with the earth and have almost made it come to an end several times, but they never seem to get enough courage to let this planet become devoid of the genus *homo*. They may accept this as a challenge.

Dr. Keller, M. D. and Mr. E. R. Burroughs are your trump cards at present and you can't play them too often.

"The King of the Monkey Men" was out of place in your QUARTERLY. You would have done better if you had printed "Tarzan of the Apes."

One more thing about the authors. No matter in what planet or in what strange place they find their heroes, gold and other precious materials are as common as cobblestones and radium is liable to be present by the pound. Though every author has expressed his ideas of the future, none have as yet said a word about sports that will be.

I think that many people have the same idea as I have that Nature has made time for a purpose and it is not to be tampered with. If a man will ever travel through time, all we have to do is to look back through the old newspapers and see the notices of his arrival.

I hope to see an improvement in the name and the cover of AMAZING STORIES. Though it may be a good point to send the magazine to subscribers in a plain wrapper so that those who dislike to buy it at stands are forced into subscribing. I do not like to tear the cover off a magazine once that I have got it. Maybe you will be good enough to tear it off before distribution, thus saving many of us the trouble.

Despite my sarcasm, I wish you luck.

R. Ross
2930 Davidson Ave.
New York City.

(It is so clear as to be beyond demonstration that a radical change of the name of a periodical which has obtained so much popularity as has AMAZING STORIES, is a very delicate matter. We have had in mind for many months this very thing, but the circulation of the magazine has increased so under its original name, that it would make it appear a stranger within the gates if a totally different name were given. Even the editors would have a certain feeling of having lost an old friend if such a radical change were made.

We feel as you do about our interplanetary stories. But the trouble is that our readers want them; they tell us so in their letters. It is fair to say the interplanetary stories must involve some absurdities. The acceleration has got to be such that no living creature could stand it. We must give some interplanetary stories. We hope that your letter will be read by many of our present or prospective authors.

For possible sports of the future we might refer you to Olsen's story and to Baron Muenchhausen, as well as to various others of our stories, which, in dealing with possible life and living on other planets and even with the future on our own planet, deal also with general phases of amusement and sports which seem most adaptable to the existing physical and spiritual conditions and environment.

We have nothing to say about the cover illustrations, so many people highly approve of them.—EDITOR.)

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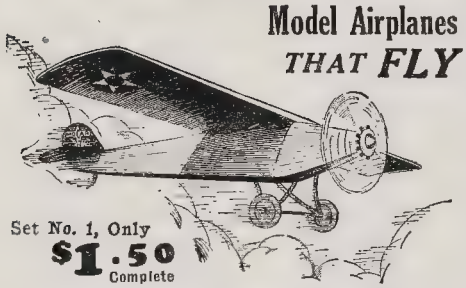

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A PLAGIARISM IN THE DISCUSSIONS COLUMNS DETECTED

Editor, AMAZING STORIES:

Ever since I went "Off on a Comet" with Jules Verne, I have not missed a copy of "AMAZING STORIES." I have found something worth while in all your stories, even those I did not like.

Up to your October issue I have had no occasion to contribute to the "Discussions" Column. In this number is a letter headed "An Amusing Witty Rejoinder to Previous Correspondents" and signed by one, G. N. Garrison 8 Oak Street, East Orange, New Jersey.

Criticism is all right, but let it be original, and if not, let credit be given where due. I am sure that you, Mr. Editor, are unaware that G. N. Garrison copied his "original sass" word for word. Well, he did. What he copied was copyrighted in 1898 by Mrs. W. C. Brann. You will find the original piece of literature in "The Works of Brann, the Iconoclast," Volume 3, page 98 under the title of "Grammar Sharp."

I believe in coincidences, but this is not a case of that. I know that the editor of "AMAZING STORIES" wants to be fair, and I know that he would not have given G. N. Garrison credit for such "an amusing and witty" letter had he known where G. N. got his humor and wit.

I hope that the smart and witty boy will stick to his own ideas hereafter, and if he must criticize anyone, let him think up his own ideas, and if he can't, then surely he must give the other thinker credit for the ideas, especially on a copyrighted article. I hope that G. N. G. sees this.

Yours for the good work that "AMAZING STORIES" is so capably doing.

LESLIE F. BRUNK, ESQ.
Box 454
Fort Bayard
New Mexico

(We are deeply indebted to our correspondent for detecting the plagiarism in the Garrison communication in the DISCUSSIONS Column in our October issue. It is a sad commentary on human nature that so weak a passion as vanity should lead a man to do such a thing. The stolen text was altered to the extent of substituting the name "Farnese" for "Jenks," changing an allusion to a camp-meeting to "listening on the radio" and inserting *"Newark Evening News"* in place of the name *"San Antonio Express"* which figured in the original. William Cowper Brann who died in 1898 was a very forceful author and much that he wrote applies to the present day. He was an Editorial writer on many newspapers and his collected works are still read.—EDITOR.)

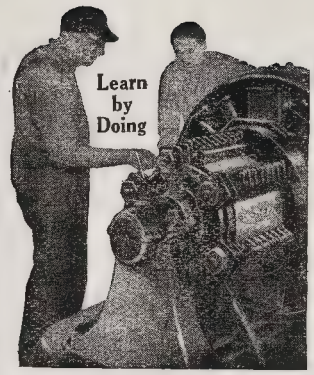
OUR CRITICS CRITICIZED; IMAGINATION IN SCIENCE; IMPOSSIBILITIES AND THE FUTURE

Editor, AMAZING STORIES:

While glancing through a few copies of the AMAZING STORIES Magazine, I noticed a number of criticisms made by some of your readers. Therefore in defense of the magazine, I wish to make a few comments about those readers. If I understand rightly, this magazine is of a Scientific Nature but is meant to amuse only and not to be taken too seriously. So if the readers of this magazine would remember this I don't think it would be necessary to criticize. And another thing is this: If the reader would stop and think that the impossibilities of yesterday are the facts of to-day, and that the imaginations of to-day may be the facts of to-morrow, then I think the reader would save his comments for other things. Of course, these criticisms show good judgment on the reader's part, but, nevertheless, they go at it too seriously. And one more word to the reader. Any man or woman who reads a book, magazine or paper that is published weekly or monthly, and finds that he must criticize, I would advise not to read any more of its copies, as it will do him more harm than good, for he is bound to be more or less skeptical and therefore, he will not get all the good out of the literature. The reason I wrote this is because I am also a reader of your magazine, and find it very amusing and my work being along scientific lines (as I am a Chemist, Microbiologist and Electrical Engineer), I am not able to find so many impossibilities as some of your readers do.

L. A. PUTNAM,
065 Hawley Rd.,
Milwaukee, Wisc.

(You speak of the comments on the magazine; the fact that we have the warm appreciation of so many readers, is the best indication that it needs no defense, and if we would begin descriminating against stories on the ground that they are impossible, we would be departing from our claims. It would be hard to say anything is impossible in the line of natural science.—EDITOR.)



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Editor, AMAZING STORIES:

Unaccustomed as I am to public writing, it is with the greatest of pleasure that I take my "typewriter in hand" to thank you for the years of enjoyment you have given me since the first publication of AMAZING STORIES.

In common with all readers and laymen, I too think I could give you a bit of advice as how to run *our* magazine. However, I shall not criticize any of the stories—for if I could do any better, I would be writing. But I do wish to criticize your criticisms. The "Discussions" are the first section of the book I turn to and I get almost as much pleasure from them as from the text itself. But, like too many other magazines, you have committed the abominable editorial fault of calling for criticism and then attempting to overbear and crush those comments by the mere weight of your position.

If the criticisms—which you called for—are good enough to print, they ought to stand on their own merits or at least be attacked from the standpoint of logic and not of "the author knows enough about this subject, etc." Does one have to be a Bacon to criticize Shakespeare? In the March issue you have toned down a bit—but the praising of those who agree and the castigation of those who don't could be decreased to a great extent.

You write in the column that you will improve the paper and pictures as soon as the circulation will improve. This sounds like "some are seeking for power in order to gain wealth; and others for wealth to gain power." How can you get a bigger circulation with a mediocre publication?

Now let's settle that four dimensional argument once for all. Here are some quotations from the "Fourth Dimension Simply Explained" by Henry Manning, Ph.D. –a book containing *prize winning essays on the fourth dimension.*

H. Manning: "Nor on the other hand, will the most elaborate development of the analogies of different kinds ever prove that it (the fourth dimension) really exists."

Col. G. H. Fitch, U. S. A. Engineers: "It is impossible to form a mental picture of the fourth dimension."

E. M. Cutler, A.M.: "The fourth dimension has no real existence in the sense in which the external world that we know by means of our senses has real existence. It is a philosophical and metaphysical conception whose actual existence cannot be demonstrated by observation or by logical reasoning."

C. A. Richmond: "The fourth dimension is intangible. Mathematicians do not ask us to imagine a fourth dimension, much less do they ask us to believe in it. It is not supposed that the most skilled student in these subjects has a mental picture of four dimensional space."

C. Bragdon: "The reality of the fourth dimension may be said to be an open question."

A. R. Crathorne: "To the question if a fourth dimension really exists, all we can say is that it is highly improbable."

P. L. Gunmaer: "No amount of reasoning will prove the existence of such a space."

From a book explaining the fourth dimension. 'Nuff said, there "ain't no such animal."

Incidentally, I'm for a semi-monthly, less serials, and the QUARTERLY.

MILTON EMLEIN,
608 Otves St., Sioux City, Iowa.

(If there is one thing that delights the editor, it is a good-sized brickbat. That makes him sit up and take notice. One of our correspondents has done this very well, and the first part of his letter speaks for itself. The second part, which relates to the fourth dimension, is very well taken, but the trouble with it is that most of the quotations are antiquated by modern thinkers, particularly the Einstein school, which considers that the fourth dimension is the space-time conception. For instance, if you say the Cheops pyramid is so wide, so long and so high, that, according to Einstein and his followers, means nothing at all, because its position at a particular time is left out entirely. Even to say that the pyramid was in a particular position at 12 o'clock on Tuesday, September 4th, 1928, is not a complete statement, because it would only hold true for Egypt, but would make no reference at all as to what part of space the pyramid was facing at that particular moment. The earth, is spinning around its axis, and while thus spinning, is also rotating around the sun in its orbit. Again, the entire planetarian system moves itself, from which it will be seen that it becomes pretty much of a complicated statement to state exactly where the pyramid was at Noon, Greenwich time, Tuesday, September 4th, 1928.

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Of course, Television is far from perfected. It is still in a most elementary stage. There is little use in trying to gloss over the truth. But a start has been made and it remains for the "fans" to do their share, as in radio, in helping to develop the new art.

In the last issue of TELEVISION there are full instructions from which you ambitious enthusiasts can construct an efficient experimental set. With this set you will be able to receive some of the Television programs now being broadcast. Experimenting will continually improve reception. Get your copy of this new issue today! Start to work on your Televisor tonight! Be the first in your neighborhood to have a Television set. The old "fan days" are here again. Don't miss the fun!

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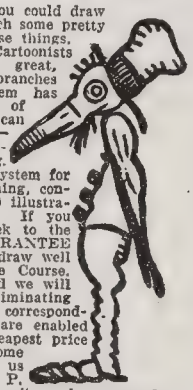

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To an observer in space, anchored solidly, without any motion at all, the top of the pyramid would describe a most complicated figure within five seconds after Noon of that fateful Tuesday, as you readily can see.

So you see, there is a fourth dimension, and while it may not agree with the ideas of most scientifiction writers, yet, you must admit, and modern science certainly does admit, that there must be such a thing.—EDITOR.)

DR. MILES J. BREUER TAKES EXCEPTION TO W. ALEXANDER'S STORIES DEALING WITH TRANSPLANTATION OF ORGANS FROM ONE BODY TO ANOTHER

Editor, AMAZING STORIES:

"Professor H. Ocus Pocus puffed at his cigar and looked at me triumphantly.

"'What color do you want next?' he inquired.

"'Make it green!' I gasped in amazement.

"'All right. Green. With a cheesy consistency. Look!'

"He pressed the button. Right before my eyes, as I gazed out of his observatory window, the moon rapidly changed color and became a bright green, its surface at the same time taking on a texture faithfully suggestive of cheese. And before my amazed eyes, he moved his levers and pressed his buttons, and changed the moon to bright red and then to pale lavender. He rolled it up the sky, puffed it out like a balloon, and shrivelled it to a bright, sparkling point.

"Professor Pocus was the most distinguished astronomer in the world. For many years he had been changing the color of the moon, and pingponging it all about the sky. Astronomers from foreign nations made pilgrimages to his observatory and universally recognized him as the cat's whiskers in astronomy—"

Does it sound just a little bit off to you?

Well, that is just the way Mr. W. Alexander's stories sound to me. Here comes a new one (The Ananias Gland) in which another wizard transplants organs from one body to another!

Just like that!

No one (including Mr. Alexander) who is not a biologist, can grasp how excruciatingly absurd the transplantation of stomachs and glands and hearts looks in a story. If AMAZING STORIES were some sort of a burlesque refuse-heap, the sport of innocent clowns, that might get by. But the stories in this magazine are supposed to carry an air of plausibility with them; they are supposed to be built on some sort of foundation that has at least an *appearance* of being scientific. Green-cheese phenomena should not appear in it, side-by-side with the intelligent efforts of people who have worked hard to build up some scientific ideas.

The fact of the matter is, the editorial staff of AMAZING STORIES seems to be thoroughly on its toes in respect to the physical sciences, but, reveals here and there, a distressing hiatus in the biological sciences. Mr. Gernsback would never permit such a raw fizzle as this to get by him in the field of physics, chemistry, or astronomy. But they get by him in the field of biology, especially the highly specialized department of biology.

Why not get some one with a thoroughly trained biological, especially medical mind, to pass on that class of material?

MILES J. BREUER, M.D.
Federal Trust Building,
Lincoln, Neb.

(Mr. Gernsback, who read the above by Dr. Breuer, wishes to state, without being discourteous, that AMAZING STORIES tries to make it a rule that the science in all of the stories be as plausible as possible. Very often reference books of various kinds are consulted and an otherwise good story is only rejected when it looks hopeless from a scientific angle.

On the other hand, authors must be allowed a good deal of leeway and poetic license.

Yet, the staff of AMAZING STORIES is pretty well grounded in the various sciences, and biology is no exception. We must disagree with Dr. Breuer on the transplantation of glands, and we respectfully refer to one of the latest scientific works entitled, "The Conquest of Life," by Dr. Serge Voronoff. Dr. Voronoff, for years, has transplanted hundreds of glands, particularly the interstitial gland from male monkeys into humans, with excellent results. Not only that, he accomplished the much more difficult feat of rejuvenating women by transplanting female chimpanzees' ovaries into women. It is known today, that these transplantations were a success.

German investigators have transplanted heads of insects which lived for a long time thereafter. Only recently a unique eye operation was performed—from last reports very successfully.

It is, of course, absurd, at the present time, to think of transplanting stomachs or hearts, but, perhaps, a hundred years from now, it won't be quite so absurd.—EDITOR.)

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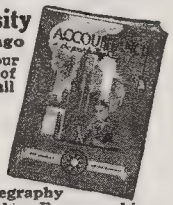

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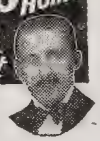

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